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THE M. A. C. BULLETIN

AMHERST, MASS.

Vol. III. No. 1.

January, 1911.

Published Six Times a Year by the College.

Jan., Feb., Mar., May, Sept., Oct.

ENTERED AS SECOND-CLASS MATTER AT THE POST OFFICE, AMHERST, MASS.

Public Document

No. 31

FORTY-EIGHTH ANNUAL REPORT

OF THE

MASSACHUSETTS

AGRICULTURAL COLLEGE.

PART I.

REPORT OF THE PRESIDENT AND OTHER OFFICERS

FOR FISCAL YEAR ENDING NOV. 30, 1910.



BOSTON:

WRIGHT & POTTER PRINTING CO., STATE PRINTERS,

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APPROVED BY

THE STATE BOARD OF PUBLICATION.

The Commonwealth of Massachusetts.

MASSACHUSETTS AGRICULTURAL COLLEGE,
AMHERST, Dec. 1, 1910.

To His Excellency EBEN S. DRAPER.

SIR: — I have the honor to transmit herewith, to Your Excellency and the Honorable Council, Part I. of the forty-eighth annual report of the trustees of the Massachusetts Agricultural College, for the fiscal year ended Nov. 30, 1910, this being the report of the president and other officers of the corporation of the college.

I am, very respectfully, your obedient servant,

KENYON L. BUTTERFIELD,
President.

REPORT OF THE PRESIDENT OF THE COLLEGE.

Gentlemen of the Corporation.

I herewith submit my fifth annual report as president of the college.

ATTENDANCE.

The attendance of students of college rank for the last college year exceeded that of the previous year by 68, and aggregated 320 four-years men, 12 unclassified students of college grade and 18 graduate students; there were 260 in various short courses, making a total attendance of 610. The entering class the present autumn numbered 158, the largest previous freshman class being 131, a year ago. The total number of four-years men in present attendance is 402; of unclassified students, 17; of graduate students, 15. (See Table I.)

Eighty-five per cent. of the present freshman class come from Massachusetts, with 9 other States and 1 foreign country, China, represented.

About one-fifth of the class are undecided as to their intended vocation; about one-third of the whole class state that they intend to follow some phase of professional agriculture or horticulture; and considerably more than one-third of the whole class state that they intend to follow some phase of practical agriculture or horticulture. Ninety-one per cent. of those having made a decision intend to follow an agricultural vocation. Less than one-fourth of the fathers of the members of the freshman class are engaged in agriculture or horticulture, and a trifle over one-fourth of the members of the freshman class were brought up on farms, although more than one-half of those not brought up on a farm have had some farm experience. The average age of the entering class is approximately nineteen years. (See Table IV., J.)

APPROPRIATIONS.

The total amount of special appropriations asked of the last Legislature was \$277,500; the total amount granted was \$115,625. An increase in the current annual appropriation was

asked, amounting to \$110,000; the amount granted was \$37,500. (See Table II.)

The legislative appropriation of \$15,000 has enabled us to equip in a complete manner the new building for entomology and zoölogy. Some delay was experienced in the completion of the building and the installation of the equipment; but the building is now fully used, and was dedicated with appropriate ceremonies November 11. The legislative appropriation of \$17,500 for the purchase of land has enabled the college to acquire the larger proportion of the land on which options were held.

The legislative appropriations for land made during the past three years aggregate \$23,500. This money has been expended in acquiring the following parcels:—

Appropriations for Land.

1908, ...	\$500 00
1909, ...	5,500 00
1910, ...	17,500 00
	\$23,500 00

Expenditures for Land.

Louisa Baker property, ...	\$5,636 91
Old creamery property, ...	1,726 25
Westcott property, ...	2,250 00
Harlow property, ...	3,284 00
Kellogg property, ...	5,868 45
E. Baker property, ...	2,500 00
George Allen property, ...	500 00
Charmbury property, ...	450 00
Loomis property, ...	415 00
Hawley and Brown property, ...	675 00
	\$23,305 61
Attorney's fees, ...	128 41
Balance, ...	65 98
	\$23,500 00

Appropriations for two new buildings were granted by the Legislature: \$12,000 for a laboratory for pomology and market gardening, and \$10,000 for a building for animal husbandry.

The former building, while essentially an instruction building, will afford admirable facilities for both experiment and teaching in the subject of cold storage of fruits and vegetables, for packing and for other forms of laboratory work in pomology.

The animal husbandry building fills a serious gap in the college equipment, enabling the courses in stock judging to be put on a thoroughly modern basis, affording also ample room for the large classes entering during the short winter courses, serving as an auditorium for gatherings of farmers to witness demonstrations of various sorts, and, in general, as an arena for demonstration instruction. A brief description of both these buildings follows.

Building for Pomology and Market Gardening. — The new laboratory and storage building for pomology and market gardening is 74 by 42 feet, and consists of basement, one story and attic. In the basement are three large storage rooms, — one for vegetables and two for fruits, — where the bulk of the larger fruits and vegetables will be stored. On the ground floor is a large laboratory room for pomology, 18 by 56 feet, where such practicums as packing, testing spray apparatus, and other operations which require plenty of room, will be carried on. Adjoining this are three fruit rooms, — a large frost-proof room and two refrigerated rooms, one large and one small, each with its separate cooling apparatus, so that the rooms may be kept at different temperatures. In the attic are large storage rooms for fruit packages, ladders, spray pumps and the like. An elevator connects the various floors.

The vegetable gardening rooms on the main floor consist of a workroom; squash room, for storage; and four refrigerated compartments, each with its separate cooling system, to allow each being kept at a separate temperature. These rooms are designed especially for experimental work, and will be used also for the work of advanced students in vegetable gardening.

The Animal Husbandry Building. — This building, now nearing completion, is located directly south of the horse barn. It is 80 feet long and 50 feet wide, outside measurements, the longest dimension running north and south. The arena, which occupies the center of the building, is 27 by 78 feet, with tan-bark floor and large doors at each end. On the west side of this

there are five rows of seats, each row being fifteen inches above the one in front of it, so that every seat gives an unobstructed view of the arena. These seats will accommodate 180 persons without crowding. Under these there is a detention stable for stock brought from other farms; this will obviate the need of putting such stock in the college stables, and will also serve as a quarantine if needed. On the east side of the arena is a cement walk 6 feet wide, with a visitors' gallery above that will easily seat 63 people. In case of necessity chairs could be placed in one-half of the arena, giving seating capacity for 500 persons. A rolling partition across the center of the building makes it possible to use it either as one large or two smaller class rooms for judging, lectures or recitations.

The building is of brick, with slate roof, heated by steam and lighted by electricity. The cost of maintenance should be low.

COMMENCEMENT.

Commencement occurred June 22, and the college conferred the degree of Bachelor of Science on 43 men, and the degree of Master of Science on 1. The commencement address was given by Mr. Lucius Tuttle, then president of the Boston & Maine Railroad Company. President Tuttle's address was a strong discussion of the vocational trend of modern education. It was followed by remarks by Governor Eben S. Draper. The attendance at the alumni dinner was 178.

SUMMER SCHOOL.

The summer school registration for 1910 was 229. A few new courses were added, but in general the plans for our previous summer schools were duplicated.

In connection with the summer school there was held a gathering that we believe to be unique in the history of agricultural progress. Under the auspices of the summer school there was held a "Conference of Rural Social Workers" for the four days August 9 to 12 inclusive. The forenoon meetings consisted of sections, or departments, the program for each of which had been prepared by some organization representing a special interest, and included meetings for country clergymen, teachers of agriculture, rural teachers, local officers and paid workers in

the rural department of the Young Men's Christian Association, lecturers of subordinate granges, officers of village improvement societies, and rural librarians. Each afternoon all delegates were brought together for a common program on some important phase of country life. Each evening there were formal addresses. The total registration of different individuals for the four days was 335, inclusive of perhaps 40 grange lecturers, who were present only for one day.

The fundamental idea of the conference was that of bringing together for consultation about concrete methods the local leaders in the rural communities of Massachusetts. The attendance, interest and even enthusiasm of those present fully justified the meeting.

THE WINTER SCHOOL.

The attendance at the winter courses was 64, this being about the same number as enrolled in 1909. A special addition was made by the giving of a two-weeks poultry course. The school itself was concluded by a farmers' week, which furnished a most admirable program, and brought together at least 559 different people.

EXTENSION WORK.

The extension work, begun so auspiciously a year ago under the leadership of Professor William D. Hurd, has more than met expectations. In fact, so pressing have been the calls for lectures, for demonstration orchards, for correspondence courses and for other phases of work, that our faculty has been wholly unable to cope with this demand. One of the most progressive features of the last season's work was the running of a better-farming trolley train in co-operation with the State Board of Agriculture, the State forest service and the Springfield Board of Trade. The New England Securities Company, managers of some 600 miles of inter-urban trolley lines in Massachusetts, furnished the train, and made most admirable plans for the carrying out of the project. I speak of this enterprise particularly because, so far as we know, it is the first time that the inter-urban trolley has been used for agricultural educational purposes. I cannot, however, neglect to call attention to the great success of the better-farming train, run under the most

efficient management of the Boston & Albany Railroad, in which we co-operated with the State Board of Agriculture, the State grange and the State forest service.

I present here a few facts concerning the details of the work of the extension service during the past year:—

Statistics of the Extension Department.

Enrolment in conference of rural social workers, ...	335
Grange lecturers in above, ...	40
Enrolment in farmers' week, ...	559
Lectures given by faculty, ...	159
Lectures refused, ...	197
Total number in correspondence courses, ...	252
Demonstration orchards, ...	6
Better-farming trains:—	
Boston & Albany, ...	4 days
Trolley, ...	3 days
Attendance at lectures given from above, ...	9.000
Exhibits at fairs (5 or 6 lectures and demonstrations given each day at each fair), ...	5

Other Work of the Extension Department.

Ten-weeks course, enrolment, ...	64
Poultry course, enrolment, ...	51
Beekeepers' course, enrolment, ...	20
Summer school, enrolment, ...	229

Conference on rural progress at West Newbury.

Advisory work with Faunce Demonstration Farm at Sandwich.

Co-operative work with Smith School of Agriculture at Northampton.

Numerous visits to farms to give advice.

Hundreds of letters answered.

Co-operation with tent camp meetings.

CHANGES IN FACULTY AND OTHER OFFICERS.

Last June, Professor Charles H. Fernald resigned as director of the graduate school, professor of zoölogy and entomologist of the experiment station. He was granted a pension from the Carnegie Foundation, and was retained by the college as honorary director of the graduate school.

Professor Fernald had served the college for twenty-four years, and not only had he built up a strong department of zoölogy, but he created the department of entomology, and built

it into one of the strongest departments of its kind in the United States. It was under his leadership that the graduate work of the college had its special development, and a large number of his former pupils are occupying most important teaching positions in the field of economic entomology. The new building for entomology and zoölogy is a splendid monument to his labors, and indicates objectively something of the professional skill, teaching ability and conspicuous success of this long period of service which Professor Fernald has rendered to the Massachusetts Agricultural College.

I regret to record that soon after the beginning of this last fiscal year Dean George F. Mills was taken suddenly and seriously ill. For many weeks his condition was alarming, and it was only after a prolonged convalescence that in the late summer he was enabled to leave the house. At the opening of the college year it was quite out of the question for him to resume his duties as dean, and he was therefore granted a leave of absence for the present college year. Students and faculty alike hope that his full strength may come to him again, and that he may be long with us in the most important and delicate position which he occupies as dean.

In January, 1910, Professor Fred W. Morse accepted a temporary appointment at the experiment station as assistant research chemist; in June the trustees made this position permanent for Professor Morse. Professor Morse received his training at Worcester Polytechnic Institute, graduating from that institution in 1887, and receiving his degree of M.Sc. in 1900. From 1888 to 1909 he was employed by the New Hampshire College of Agriculture and Experiment Station; from 1896 he was vice-director of the experiment station, and from 1889 he was professor of chemistry in the college there.

During the year the trustees created the department of zoology and geology, and placed Assistant Professor Gordon in charge; previously these two subjects have been separated.

Professor Waugh was granted a leave of absence for six months, beginning February 1; he spent the period in Europe, and at the opening of the present college year was back to take up his work here. During the entire college year Professor F. C. Sears served with signal ability and marked success in Pro-

fessor Waugh's stead as acting head of the division of horticulture.

Mr. John R. Parker, graduate assistant in entomology and pomology, resigned to accept a position at the Montana College of Agriculture.

The course in rural law has been discontinued, and with it the services of Judge Robert W. Lyman of Northampton.

In February, 1910, Mr. Harold F. Tompson resigned as instructor in market gardening, and Mr. Charles S. Heller, a graduate of the Michigan Agricultural College, was elected to fill the vacancy.

Mr. Harry M. Jennison resigned his position as assistant in botany to take up work of like character in Wabash College.

Mr. Burke Hough resigned as purchasing agent, and Mr. William Chesley was appointed steward of the dining hall in his place.

During the summer Mr. Carl D. Kennedy resigned as assistant in the experiment station, and Mr. Clement L. Perkins, a graduate of the New Hampshire Agricultural College of the class of 1910, was appointed to fill the vacancy.

In June Mr. Roy F. Gaskill resigned as assistant in animal nutrition for the experiment station, and Mr. James R. Alcock is now filling that position.

Mr. Arthur I. Bourne, a graduate of Dartmouth College and formerly a graduate student at this institution, was made assistant entomologist for the experiment station in place of Mr. John N. Summers, resigned.

During the summer Miss Ola H. Perrin resigned as clerk to the director of short courses, and Miss Mabel R. Case, a graduate of Boston University, was appointed to that position.

The following minor changes in titles, etc., are also to be noted:—

In January, 1910, Dr. Joseph B. Lindsey was made vice-director of the experiment station; the title of Professor William D. Hurd was changed to that of director of extension work; Professor James A. Foord was made permanent head of the division of agriculture; Dr. James B. Paige has been acting dean since Jan. 1, 1910, in the absence of Professor Mills; Mr. Anderson A. Mackimmie was elected assistant to

the dean; Professor Henry T. Fernald, on the resignation of Professor Charles H. Fernald, was chosen entomologist for the experiment station and acting director of the graduate school; Professor Philip B. Hasbrouck resumed his duties in September, after a year's leave of absence; Assistant Professor William P. B. Lockwood was made associate professor of dairying; Assistant Professor Robert W. Neal was made associate professor of English; Mr. Sidney B. Haskell was made assistant professor of agronomy; Mr. Floyd B. Jenks was made assistant professor of agricultural education; Dr. Alexander E. Cance was made assistant professor of agricultural economics; Mr. Frederick B. McKay was made assistant professor of public speaking and English; the title of Mr. John Summers was changed to that of graduate assistant.

OFFICERS FOR NEW POSITIONS.

In 1909 the department of forestry was created; not until August, 1910, was there secured a suitable man to take charge of this work. Frank F. Moon, A.B., M.Fr., was elected as associate professor of forestry, and began his duties September 1. Professor Moon graduated from Amherst College in 1901, and from Yale Forest School in 1909; he has had experience in the United States Forest Service, and with the Fish and Game Commission of New York State.

Dr. Burton N. Gates was chosen assistant professor of beekeeping. Dr. Gates graduated from Clark College in 1905 with the degree of A.B., and in 1906 received the degree of A.M. from the same institution; he attended Cornell University and took his Ph.D. degree there in 1909. He has been serving in the United States Bureau of Entomology since 1906 as expert in apiculture, and later as assistant in apiculture. Dr. Gate's employment began July 1; he will serve as expert in beekeeping for the experiment station and as inspector of apiaries for the State Board of Agriculture, as well as assistant professor of beekeeping in the college.

Mr. Alvah J. Norman was elected as instructor in pomology, his services beginning Sept. 14, 1910. Mr. Norman graduated from the Iowa State College in 1906, and received the degree of M.Sc. from the Maryland Agricultural College in 1910; he

will devote most of his time to work in the extension and short course department.

Mr. Charles J. Robinson has recently been made instructor in dairying and animal husbandry. Mr. Robinson is a graduate of the University of Illinois of the class of 1909, and has had wide experience in practical dairy work. He will assist in the extension and short course work of the college as well as in the regular courses.

Mr. Sumner C. Brooks fills the position as assistant botanist for the experiment station created by the trustees in January, 1910. Mr. Brooks is a graduate of the Massachusetts Agricultural College of the class of 1910.

Mr. W. A. Turner is serving as assistant in chemistry. Mr. Turner graduated from the Sheffield Scientific School in 1910, with the degree of Ph.B.

The trustees authorized an assistant in the department of English, and elected Miss Helena Goessmann of Amherst to the position; Miss Goessmann's active services are to begin Jan. 1, 1911.

Mr. E. M. J. Evans is serving temporarily as laboratory assistant in bacteriology.

Miss Dorothy Mudge of Boston was appointed to the position of clerk in the office of the treasurer, created by the trustees in June, 1910.

DEATH OF DR. GOESSMANN.

On September 1, Dr. Charles A. Goessmann passed away. His connection with the college began in January, 1869, and continued uninterruptedly until 1907, when he was relieved of his active duties and made honorary director of the experiment station, and in June, 1908, honorary professor of chemistry.

I cannot here record the services nor eulogize the work of Dr. Goessmann. Appropriate memorial exercises were held in the college chapel October 12, and some steps will be taken to preserve in permanent form a record of his work. But I cannot refrain from calling your attention to the fact that it is the work and the character of men like Dr. Goessmann that, after all, make an educational institution great and strong. We need land, we need buildings, we need teaching equipment

and apparatus; but we must have superior men. A strong, virile man with inferior equipment is worth any number of inferior men with the most modern equipment. One lesson of Dr. Goessmann's life as it affects the management of our college is that of careful selection of strong investigators and teachers, and reasonable and justifiable rewards for their work.

LEGISLATIVE BUDGET.

The legislative budget, as voted by the board of trustees at its meeting in Boston, November 4, may be summarized as follows: —

*Requested Increases in Current Funds, Available for Fiscal Year,
Dec. 1, 1911, to Nov. 30, 1912.*

ITEMS.	Increase.	Total.
Administration, ...	\$4,250	\$25,000
Maintenance and equipment, ...	43,250	88,000
Investigations, ...	5,000	15,500
Instruction, ...	22,500	70,500
Short courses and extension teaching, ...	15,000	30,000
Inspection service, ...	—	3,000
	\$90,000	\$232,000

Requests for Appropriations for Special Purposes, 1911.

Improvements, west experiment station building, ...	\$7,500
Enlargement of Draper Hall, ...	25,000
Dormitory, ...	20,000
Dairy building and equipment, ...	75,000
Department equipment, ...	15,000
Repairs, ...	20,000
General improvements, ...	25,000
	\$187,500

A brief statement or explanation of the need of these various amounts may well be made a part of this report.

Reclassification of Current Funds. — The trustees voted to ask the Legislature for an increase in current annual income, totaling \$90,000 a year, divided into six different heads, representing the main types of work followed by the institution, namely: administration, maintenance and equipment, investiga-

tion, instruction, short courses and extension teaching, inspection service.

An explanation of the increases asked for will be clearer if I retain the old classification at this point. The following are the items:—

Instruction. — Increase, \$15,000. This amount would bring the total for instruction purposes to \$70,500, \$5,000 more than was asked of the Legislature last year. This increase is necessary in part because of the increase in attendance of students. During the past four years many of the subjects required of all students, such as chemistry, mathematics and English, have doubled in attendance. The instruction force in these subjects, however, has very slightly increased. The consequence is that the teaching sections are inordinately large, — so large, in fact, that it is out of the question to get the best results of the teaching. These fundamental subjects, given to the students in the early years of their college course, should be given under the very best auspices, and one of the prime requisites is an ample teaching force, so that small sections may be the rule and so that no teacher shall be overworked. The close personal attention of first-class instructors in these subjects and at this time of the college course is vital to strong work on the part of the students. At least seven additional instructors are needed at once for work in chemistry, entomology, English, French and German, physics and mathematics.

The scope of our agricultural colleges is constantly broadening. Not many years have passed since a professor of agriculture and one or two assistants sufficed for instruction in agriculture; now there are numerous departments under the general name of agriculture, and we rarely find a professor of agriculture. In our own college during the past few years the professorship of horticulture has been broken up into professorships of landscape gardening, pomology, floriculture, market gardening and forestry. While we wish to avoid undue multiplication of departments, we must recognize new fields of work. At present the college gives no attention whatever to some very important branches of agricultural instruction. A State college of agriculture also has an obligation to turn out good citizens and well-rounded men. It is important, therefore, that we have

well-developed departments of economics, political science, etc. We ought to be able to establish next autumn departments of farm mechanics, bacteriology, poultry husbandry, economics and sociology, in addition to the instructorships already named. These important departures I realize cannot all be made even with an increase of \$15,000 a year additional for instruction; but they demonstrate the need of at least that much increase as a minimum.

Maintenance. — Increase, \$15,000. This increase would bring the item of maintenance and equipment to a total of \$88,000. While the treasurer's report shows a comfortable financial balance for the fiscal year, this balance was purchased at the sacrifice of several new departments which in justice to the students should have been established this last autumn. Not only have we new instructors and departments to provide for, but the large entomological building must be heated and lighted and cared for; the new buildings for animal husbandry and pomology will require similar support, and the increase in the number of students necessarily calls for some increased cost of maintenance. In order to provide for this natural growth it is necessary that the maintenance item shall be considered an essential appropriation.

Graduate School. — Increase, \$2,500. This increase was recommended last year. The graduate school is very important, but cannot be developed without more funds, and the amount asked for is exceedingly small for the purpose.

Normal Department. — Increase, \$5,000 a year. This department needs clerical help and additional instruction. The department had over 7,000 boys and girls in corn and potato clubs this past season, and this valuable work can be greatly — almost indefinitely — increased with the proper office help and supervision. The amount is the same as that asked last year.

Short Course and Extension Work. — Increase, \$15,000. The short course and extension work has grown very rapidly during the past year. Not less than 9,000 people were reached by the better-farming trains. Over 250 people are taking correspondence work in agriculture. Scores of lectures are given by our college teachers, and many more declined for lack of men to send. Demonstration orchards have been started in various

parts of the State, and many others are demanded. It is exceedingly important that we should be able to push a strong educational campaign in Massachusetts on behalf of dairy farms. We also want to take advantage of the new interest in corn growing. In some respects this extension work is the most important work of the college, because it reaches the great body of farmers directly with practical instruction and help regarding modern methods of agriculture and horticulture.

Student Labor. — Increase, \$2,500 a year. This is needed because of the large increase in the number of students.

Agricultural Survey. — \$5,000 a year. The United States Department of Agriculture proposes to make a soil survey of the State, but insists upon our co-operation. In order to carry on in adequate fashion a comprehensive campaign of agricultural education in Massachusetts, it is necessary that we shall make an inventory of the agricultural resources of the State. We need a soil survey. We need to map the orchard lands and corn areas, to study farm management, to investigate the conditions that govern the sale of the farmers' products, and even to study the community life and institutions. In this way alone can we know thoroughly the real problems of Massachusetts agriculture and country life, and be prepared to give the very best advice. Some phases of this work are being done in many other States, and we should not lag behind. The willingness of the United States Department of Agriculture to co-operate places an obligation upon the State of Massachusetts.

Grounds. — \$5,000. This amount is needed annually for the development of roads, walks, drives, plantings and the general care of the same. The amount at present expended is in the neighborhood of \$2,000 a year, and is simply an up-keep, and, indeed, is not sufficient for that, and does not permit of any improvements whatever.

Repairs. — \$15,000 a year. I recommended in my last report that we should ask the Legislature for not less than \$15,000 a year for the purpose of the contingent repairs. This amount is about 3 per cent. of our inventoried valuation of buildings, and is by no means excessive. At present we are obliged to ask each Legislature for a special appropriation for this pur-

pose. We could manage the matter in a much more business-like fashion, and relieve the Legislature of the necessity of going over small details, if we had this amount coming to us annually.

Equipment. — \$10,000 a year. The same arguments advanced for the permanent repair item apply to the permanent item of teaching equipment and apparatus for the various departments of the institution. It is expected that whenever a new building is erected a special appropriation shall be asked for to equip that building thoroughly. This item is intended to maintain the inventory of existing departments with respect to teaching equipment, apparatus, farm tools, live stock, etc., and is designed to take the place of the special legislative item for these purposes which goes to the Legislature each year.

Administration. — This item in the new classification represents the salaries and office expenses of the officers of the institution whose duties are largely or wholly administrative. It is also intended to include a small amount, perhaps \$5,000, which shall serve for emergencies of various types. The new classification will make it possible to present a more complete picture of the work of the institution and the expenditures of money, and I trust may be adopted by the Legislature.

Requests for Appropriations for Special Purposes.

Improvements, West Experiment Station Building. — \$7,500. This building has been quite outgrown by the development of experimental work in chemistry and by increase of inspection service devoted to fertilizers and feed stuffs. The experimental work particularly is seriously handicapped by this lack of room. Last year the Legislature was asked to appropriate \$28,000 for the enlargement of this building. It was thought at the time that the best plan would be to enlarge the building sufficiently to serve both the instruction work and the research work in chemistry. The appropriation was refused by the last Legislature, and the plans during the past summer were redrawn. Estimates obtained on the revised plans indicated that the amount of \$28,000 would not be enough to make the changes, and the trustees decided that under these circum-

stances the best policy was to spend a comparatively small amount of money in some minor changes in the present building, and then plan for an entirely new building, to be asked for in the early future, for the purpose of housing the experiment station work in chemistry. It is thought that \$7,500 will make it possible to continue the inspection service in this building for many years to come, and will temporarily give relief to the research work in chemistry.

Enlargement of Draper Hall. — \$25,000. This improvement was asked for last year. The present dining hall barely accommodates the present number of students, and next autumn will undoubtedly be entirely too small for the probable number in attendance. When the building was erected less than 75 students took their meals at the dining hall. At the opening of this fall term nearly 350 students were taking their meals there, although the number has decreased somewhat since then; but during the ten weeks' winter school there will be a demand from 75 or 100 more men for boarding facilities. It is easily seen, therefore, that this is an improvement that is well-nigh imperative.

Dormitory. — \$20,000. At the present time the college is housing on the college campus about 75 out of its 400 students. It is difficult for students to find rooms in the village, and often the price that they are obliged to pay is beyond the ability of students who are working their way through college. A study has been made of the problem of securing a modern dormitory at a minimum cost. The plans as presented call for a well-built structure of pleasing architecture, with modern conveniences, the specifications showing that it can be built for an expenditure not exceeding \$400 per occupant. On this basis the trustees believe that it will be possible, at a rental to the students not to exceed \$1.25 per week, to heat the building, furnish janitor service, provide for future repairs, and still secure a return on the investment of at least 4 per cent.

Dairy Building and Equipment. — This appropriation was asked of the Legislature last year, the same amount and practically the same plan, \$75,000. The dairy industry is the largest single agricultural industry in the State of Massachusetts. It deserves special recognition by the Commonwealth, and particu-

larly on the educational side. This building will enable us to develop a thoroughly modern plant. The dairy work at the college is very popular, both with the regular and special students. The present facilities are wholly inadequate.

Department Equipment. — \$15,000. This item comprises miscellaneous teaching apparatus and office equipment for the various departments.

Repairs. — \$20,000. To be used for general repairs about the institution, — repairs of buildings, offices, heating and lighting plant, water system, sewer system, etc.

General Improvements. — \$25,000. This covers miscellaneous items as presented by the treasurer of the college and other various departments, such as small buildings for beekeeping, sheep sheds, storage building for plumbing and carpenter equipment, intercommunicating telephone system, improvements in the electric light plant, new sewers, etc.

Respectfully submitted,

KENYON L. BUTTERFIELD,
President.

AMHERST, Nov. 30, 1910.

STATISTICS OF THE COLLEGE.

TABLE I. — *Attendance.*

	For Year ending June 30, 1910.	For Year ending Nov. 30, 1910.
Graduate students, ...	18	15
Senior class, ...	45	47
Junior class, ...	50	87
Sophomore class, ...	91	110
Freshman class, ...	134	158
Unclassified students, ...	12	17
	— 350	— 434
Short courses: —		
Winter course, 1910, ...	64	64
Summer school, ...	176 ¹	229 ²
Bee course, 1910, ...	20	20
	— 260	— 313
Total, ...	610	747

¹ Summer of 1909.² Summer of 1910.TABLE II. — *Legislative Budget, 1910.*

ITEMS.	Amount asked.	Amount granted.
1. Special appropriations: —		
Maintenance expense, ...	\$18,000 00	\$18,000 00
Instruction, ...	5,000 00	2,500 00
Normal department, ...	1,250 00	—
Short courses, ...	4,375 00	625 00
Graduate school, ...	625 00	—
Grounds, ...	1,250 00	—
Equipment, entomological laboratory, ...	15,000 00	15,000 00
Repairs and improvements, ...	35,000 00	25,000 00
Teaching and office equipment, ...	15,000 00	10,000 00
Dairy building, ...	75,000 00	—
Enlargement of west experiment station building, ...	28,000 00	—
Building for animal husbandry, ...	10,000 00	10,000 00
Laboratory for pomology and market gardening, ...	16,000 00	12,000 00
Buildings for poultry husbandry, ...	5,000 00	5,000 00
Enlargement of Draper Hall, ...	23,000 00	—
Land, ...	25,000 00	17,500 00
	\$277,500 00	\$115,625 00
2. Increase in current annual appropriations: —		
Instruction, ...	\$20,000 00	\$10,000 00
Maintenance, ...	35,000 00	20,000 00
Graduate school, ...	2,500 00	—
Normal department, ...	5,000 00	—
Short courses, ...	17,500 00	7,500 00
Repairs, ...	15,000 00	—
Equipment, ...	10,000 00	—
Grounds, ...	5,000 00	—
	\$110,000 00	\$37,500 00

TABLE III. — *Speakers for the Year.**Speakers at Sunday Services for Year ending Nov. 30, 1910.*

1909.

- Dec. 5. — Dr. Samuel A. Eliot, Boston.
Dec. 12. — Rev. A. P. Record, Springfield.

1910.

- Jan. 9. — Bishop Alexander H. Vinton, Springfield.
Jan. 16. — Rev. Philip S. Moxom, Springfield.
Jan. 23. — Rev. Herbert J. White, Hartford, Conn.
Feb. 13. — Rev. Charles F. Carter, Lexington.
Feb. 20. — Rev. Charles S. Macfarland, South Norwalk, Conn.
Feb. 27. — Rev. Albert P. Fitch, Cambridge.
Mar. 6. — President Kenyon L. Butterfield.
Mar. 13. — Dr. F. E. Emrich, Boston.
Mar. 20. — Rev. James DeNormandie, Roxbury.
Sept. 18. — President Kenyon L. Butterfield.
Sept. 25. — Mr. John Y. Beattie, Springfield.
Oct. 2. — Mr. Robert L. O'Brien, Boston.
Oct. 9. — Dr. Warren H. Wilson, New York.
Oct. 16. — Mr. Albert E. Roberts, New York.
Oct. 23. — Mr. Charles H. White, Amherst.
Oct. 30. — Dr. R. DeWitt Mallary, Springfield.
Nov. 6. — Rev. F. E. Tower, Albany, N. Y.
Nov. 13. — Hon. Frank A. Hosmer, Amherst.
Nov. 20. — Hon. Henry Bond, Greenfield.

Speakers at Wednesday Assemblies for Year ending Nov. 30, 1910.

1909.

- Dec. 8. — Dean Eugene Davenport, Urbana, Ill.

1910.

- Jan. 26. — Dr. W. I. Chamberlain, Hudson, O.
Feb. 9. — Dr. Benjamin A. Trueblood, Boston.
Feb. 16. — Prof. John S. Bassett, Northampton.
Feb. 23. — Mrs. Mabel Loomis Todd, Amherst.
Mar. 16. — Dr. Winfield Ayres, New York.
April 6. — Mr. M. V. Richards, Washington, D. C.
April 27. — Dr. David Snedden, Boston.
May 4. — Mr. Edward Porritt, Hartford, Conn.
May 18. — Mr. Henry Wallace, Des Moines, Ia. ✓
May 25. — Mr. Frederick P. Fish, Boston.
Oct. 5. — Mr. C. T. Wang, New Haven, Conn.
Oct. 19. — Dr. John Graham Brooks, Cambridge.
Oct. 26. — Dr. Joel E. Goldthwait, Boston.
Nov. 9. — Prof. Frank A. Waugh, Amherst.
Nov. 30. — Capt. George C. Martin, Amherst.

TABLE IV.—*Statistics of Freshmen entering College in September, 1910.*(A) *Home Addresses (classified by Towns and Cities).*

Agawam, ...	1	Lawrence, ...	2	Quincy, ...	1
Amherst, ...	3	Lec, ...	1	Raynham, ...	1
Arlington, ...	2	Leominster, ...	1	Rutherford, N. J., ...	1
Bangor, Me., ...	1	Lincoln, ...	1	Salem, ...	3
Belchertown, ...	1	Littleton, ...	2	Sandwich, ...	1
Blackstone, ...	1	Lowell, ...	3	Shanghai, China, ...	1
Boston, ...	17	Lynn, ...	1	Sheffield, ...	1
Brimfield, ...	1	Malden, ...	4	Sherborn, ...	1
Brockton, ...	4	Marshalltown, Ia., ...	1	Somerville, ...	1
Brookline, ...	1	Marshfield, ...	1	Southbridge, ...	1
Brown Station, N. Y., ...	1	Mattapoisett, ...	1	Southbury, Conn., ...	1
Cambridge, ...	1	Medford, ...	1	South Framingham, ...	3
Cataumet, ...	1	Medway, ...	2	South Hadley Falls, ...	2
Concord, ...	2	Melrose, ...	2	South Hanson, ...	1
Dedham, ...	1	Mendon, ...	2	Springfield, ...	3
Duxbury, ...	1	Methuen, ...	1	Stafford Springs, Conn., ...	1
Easton, ...	1	Monson, ...	1	Sunderland, ...	2
Everett, ...	1	Morristown, Pa., ...	1	Taunton, ...	1
Fall River, ...	2	Mount Kisco, N. Y., ...	1	Templeton, ...	1
Gilbertville, ...	1	Mount Vernon, N. Y., ...	1	Tolland, ...	1
Glen Cove, L. I., ...	1	New Bedford, ...	1	Townsend, ...	1
Granby, ...	1	New Braintree, ...	1	Truro, ...	1
Greenfield, ...	1	New Haven, Conn., ...	1	Wakefield, ...	1
Groton, ...	1	New London, Conn., ...	1	Walpole, ...	1
Hadley, ...	1	Newton, ...	1	Waltham, ...	1
Hanson, ...	1	New York, N. Y., ...	3	Ware, ...	1
Haverhill, ...	1	North Adams, ...	2	Wareham, ...	1
Hingham, ...	1	Northampton, ...	3	Watertown, ...	1
Holliston, ...	1	North Weymouth, ...	1	Wellesley, ...	1
Holyoke, ...	1	Oxford, ...	1	West Burke, Vt., ...	1
Huntington, L. I., ...	1	Palmer, ...	1	West Somerville, ...	2
Hyannis, ...	1	Peabody, ...	2	West Springfield, ...	2
Hyde Park, ...	1	Philadelphia, Pa., ...	1	Wethersfield, Conn., ...	1
Irvington-on-Hudson, N. Y., ...	1	Plymouth, ...	2	Wintthrop, ...	2
Kingston, R. I., ...	1	Poquonoek, Conn., ...	1	Worcester, ...	2
Lancaster, ...	1	Portsmouth, N. H., ...	1		

(B) *Home Addresses (classified by Countries and States).*

	Number.	Per Cent.		Number.	Per Cent.
China, ...	1	.63	New Jersey, ...	1	.63
Connecticut, ...	6	3.80	New York, ...	9	5.70
Iowa, ...	1	.63	Pennsylvania, ...	2	1.26
Maine, ...	1	.63	Rhode Island, ...	1	.63
Massachusetts, ...	134	84.81	Vermont, ...	1	.63
New Hampshire, ...	1	.63			
				158	99.98

(C) *Home Addresses (classified by Counties of Massachusetts).*

	Number.	Per Cent.		Number.	Per Cent.
Barnstable, ...	5	3.72	Hampshire, ...	12	8.95
Berkshire, ...	3	2.24	Middlesex, ...	32	23.13
Bristol, ...	6	4.48	Nantucket, ...	—	—
Dukes, ...	—	—	Norfolk, ...	8	5.96
Essex, ...	10	7.43	Plymouth, ...	11	8.19
Franklin, ...	3	2.24	Suffolk, ...	19	14.15
Hampden, ...	13	9.67	Worcester, ...	12	8.95
				134	99.11

(D) Nativity of Parents.

	Number.	Per Cent.
Neither parent foreign born, ...	117	74.05
Both parents foreign born, ...	25	15.82
Mother foreign born, ...	14	8.86
Father foreign born, ...	2	1.26
	158	99.99

(E) Education of Father.

	Number.	Per Cent.
Common school, ...	79	50
High school, ...	46	29.11
Business school, ...	8	5.06
College, ...	21	13.29
Deceased and no statistics, ...	4	2.53
	158	99.99

(F) Religious Census.

DENOMINATION.	MEMBERSHIP.		PREFERENCE.		TOTALS.	
	Number.	Per Cent.	Number.	Per Cent.	Number.	Per Cent.
Baptist, ...	9	5.70	4	2.53	13	8.23
Catholic, ...	15	9.49	—	—	15	9.49
Congregational, ...	37	23.42	22	13.92	59	37.34
Episcopal, ...	13	8.23	4	2.53	17	10.76
Methodist, ...	9	5.70	5	3.16	14	8.86
Miscellaneous, ...	5	3.16	8	5.06	13	8.23
Presbyterian, ...	4	2.53	—	—	4	2.53
Unitarian, ...	6	3.80	8	5.06	14	8.86
Universalist, ...	3	1.90	6	3.80	9	5.70
	101	63.93	57	36.06	158	100.00

(G) Occupation of Fathers.

	Number.	Per Cent.
Agriculture and horticulture, ...	37	23.42
Artisans, ...	30	18.98
Business, ...	48	30.37
Deceased, ...	11	6.97
Miscellaneous, ...	18	11.40
Professional, ...	11	6.97
Retired, ...	3	1.90
	158	100.01

(H) Intended Vocations of Students.

	Number.	Per Cent.
Agriculture and horticulture (practical), ...	60	37.96
Agriculture and horticulture (professional), ...	52	32.91
Engineering, ...	9	5.70
Professions, ...	2	1.26
Undecided, ...	35	21.16
	158	99.99

(I) Farm Experience.

	Number.	Per Cent.
Brought up on a farm, ...	43	27.22
Not brought up on a farm, ...	115	72.79
Not brought up on a farm but having had some farm experience, ...	59	37.34

(J) Miscellaneous Statistics.

Average age, ...	19.07 years.
Number applying for student labor, ...	92, 58.22 per cent.
Number boarding at Draper Hall, ...	142, 89.87 per cent.

TABLE V. — Loans and Gifts.

Massachusetts Experiment Station. — List of Gifts for the Year ending Nov. 1, 1910.

Park & Pollard Co., 46 Canal Street, Boston, ...	2 lullaby brooders.
J. A. Jocoy, 701 Second Street, Towanda, Pa., ...	1 Jocoy's poultry food hopper.
Bolgiano & Son, Baltimore, Md., ...	1 packet seed "My Maryland" tomato.
	1 ton muriate of potash.
German Kali Works, Baltimore, Md., ...	1 ton high-grade sulfate of potash.
	1 ton sulfate of potash-magnesia.
	200 pounds kainit.
American Ccal Products Co., 17 Battery Place, New York, ...	300 pounds sulfate of ammcnia.
	100 pounds Hubbard's raw knuckle bone flour.
Rogers & Hubbard, Middletown, Conn., ...	100 pounds Hubbard's dissolved bone black.
20th Century Co., Boston, Mass., ...	3 pounds superfine ground granitic rock.

Library. — List of Gifts for Two-Year Period, ending Nov. 30, 1910.

Allen, Dr. E. W., Washington, D. C., . . .	Complete set of "Experiment Station Record."
Brooks, Dr. William P., Amherst, . . .	Agricultural periodicals and magazines.
Carruth, Herbert S., Boston, . . .	Fifteen volumes relating to flora and fauna of New Zealand.
Chapman, George H., Amherst, . . .	Experiment station bulletins.
Clark, Mrs. Milford H., Sunderland, . . .	Magazines and books.
Crane, Hon. W. Murray, Dalton, . . .	History of the United States capitol, 2 volumes.
Fernald, Prof. Charles H., Amherst, . . .	Scientific contributions and college publications.
Fowler, F. H., Boston, . . .	Agricultural bulletins and reports.
Gage, Mrs. A. E., Woburn, . . .	"American Review of Reviews," 16 volumes.
Henry, Mrs. George, Amherst, . . .	Magazines and books.
Hosmer, Hon. Frank A., Amherst, . . .	Public documents.
Howard, Prof. S. Francis, Amherst, . . .	Magazines and newspaper clippings.
Lodge, Hon. Henry Cabot, Nahant, . . .	Congressional documents.
Mills, Prof. George F., Amherst, . . .	Magazines.
Mills, James K., Amherst, . . .	Books, photographs and magazines.
Osmun, Prof. A. V., Amherst, . . .	Agricultural bulletins and magazines.
Raymond, Prof. George L., Princeton, N. J., . . .	Ten volumes on "Comparative Æsthetics."
Stone, Dr. George E., Amherst, . . .	Magazines.
Superintendent of Documents, Washington, D. C., . . .	American Historical Association reports, document catalogues, and United States public documents.
United States Department of Agriculture, Washington, D. C., . . .	Complete set of Farmers' bulletins, and numerous other publications.
Walker, Dr. C. S., Amherst, . . .	Newspaper clippings and pamphlets.
Waugh, Prof. F. A., Amherst, . . .	Magazines and books.
Williams, Mrs. Mary E., Amherst, . . .	Books.

Special mention is gladly made concerning the large number of botanical and horticultural books recently given to the library by Mr. George C. Woolson, 1871, of Yonkers, N. Y. The larger part of the collection belonged originally to Mr. Woolson's brother-in-law, the late Dr. George Thurber, a botanist of wide reputation, and whom Dr. Sargent of Harvard described as the most accomplished horticultural writer in the country.

In presenting these books to the library Mr. Woolson gives them as a memorial to the class of 1871, and this idea is to be conveyed by the special bookplate which is to be made for this collection. A detailed description of this splendid gift of about 1,200 volumes cannot be made at this time, but it is intended to publish something of that nature in one of the college publications at an early date.

REPORT OF TREASURER

FOR THE FISCAL YEAR ENDING NOV. 30, 1910.

BALANCE SHEET.

		DR.	CR.
1909.			
Dec. 1.	To cash on hand, ...	\$4,106 58	
	To cash on deposit, ...	10,813 84	
1910.			
Nov. 30.	To special appropriation receipts, State Treasurer, . . .	121,152 88	
	By special appropriation disbursements, ...		\$121,933 47
	To experiment station receipts, ...	60,791 90	
	From State Treasurer, ...	\$13,500 00	
	From United States Treasurer	29,000 00	
	From other sources, ...	18,291 90	
	By experiment station disbursements, ...		61,674 64
	To current accounts receipts, ...	193,029 03	
	From United States Treasurer, Morrill fund, ...	\$16,666 67	
	From United States Treasurer, Nelson fund, ...	13,333 33	
	From State Treasurer, endowed fund, ...	10,613 32	
	From State Treasurer, maintenance, ...	33,000 00	
	From State Treasurer, scholarship, ...	15,000 00	
	From State Treasurer, instruction, ...	40,000 00	
	From State Treasurer, Extension department, ...	8,125 00	
	From State Treasurer, agricultural education, ...	5,000 00	
	From State Treasurer, veterinary, ...	1,000 00	
	From State Treasurer, student labor, ...	7,500 00	
	From other sources, ...	42,790 71	
	By current account disbursements, ...		182,693 14
	To student trust funds receipts, ...	57,571 79	
	By student trust funds disbursements, ...		55,777 37
	To experiment station trust funds receipts, ...	728 87	
	By experiment station trust funds disbursements, ...		471 47
	By cash on hand, ...		5,664 38
	By cash on deposit, ...		19,980 42
		\$448,194 89	\$448,194 89

STATEMENT OF THE FIRST NATIONAL BANK OF AMHERST WITH THE
MASSACHUSETTS AGRICULTURAL COLLEGE.

		Dr.	Cr.
1909.			
Dec. 1.	Balance on hand, ...	\$25,986 26 ¹	
1910.			
Nov. 30.	Deposits, ...	474,029 15	
	Interest, ...	264 29	
	Disbursements as per warrants paid, ...		\$460,111 23
	Balance on hand, ...		40,168 47 ¹
		\$500,279 70	\$500,279 70

¹ These amounts are greater Dec. 1, 1909, by \$15,172.42, and Nov. 30, 1910, by \$20,155.11, on account of outstanding checks.

SPECIAL APPROPRIATIONS.

NAME OF APPROPRIATION.	Date made.	Amount of Appropriation.	Amount previously expended.	Amount expended during Fiscal Year.	Amount expended to Date.	Amount received from State Treasurer.	Balance on Hand with State Treasurer.
Athletic field, ...	1909	\$5,500 00	\$4,761 10	\$738 90	\$5,500 00	\$5,500 00	-
Replacing barn, ...	1909	30,000 00	19,187 48	13,689 04	32,876 52	30,000 00	-
Repairs and improvements, ...	1909	33,000 00	24,620 84	8,633 93	33,254 77	33,254 77	-
Teaching equipment, ...	1909	10,000 00	4,267 28	5,738 72	10,337 40	10,337 40	-
Zoological building, ...	1909	80,000 00	16,390 31	50,380 72	66,771 03	66,771 03	\$13,246 22
Animal husbandry building, ...	1910	10,000 00	-	4,166 35	4,166 35	3,975 21	6,024 79
Investigation as to cranberry growing, ...	1910	15,000 00	-	63 06	63 06	63 06	14,936 94 ²
Laboratory for pomology, ...	1910	12,000 00	-	1,223 38	1,223 38	1,223 38	10,776 62
Land, ...	1910	17,500 00	-	11,797 11	11,797 11	11,797 11	65 98 ³
Repairs and improvements, ...	1910	25,000 00	-	16,640 06	16,640 06	15,118 95	9,881 05
Teaching and office equipment, ...	1910	10,000 00	-	2,984 13	2,984 13	2,494 51	7,505 49
Equipment for laboratory, entomology and zoology, ...	1910	15,000 00	-	5,872 19	5,872 19	5,066 67	9,933 33
		\$263,000 00	\$69,227 01	\$121,927 59	\$191,486 00	\$185,602 09	\$72,370 52

¹ There is a credit of \$3,200 under farm buildings to take care of this amount.² From this amount should be taken \$12,736.25 paid direct by State Treasurer.³ This amount was lessened by \$5,636.91 being paid direct by State Treasurer.

CURRENT ACCOUNTS.

Disbursements and Receipts.

ACCOUNTS.	Disbursements from Dec. 1, 1909, to Nov. 30, 1910.	Receipts from Dec. 1, 1909, to Nov. 30, 1910.	Apportionment for Year ending Nov. 30, 1910.	Balance to Credit.
Architects' fees, ...	\$3,155 44 ¹	—	—	—\$3,155 44
Administration, ...	4,729 04	\$30 07	\$5,010 00	310 96
Agricultural, ...	22,028 79	16,339 90	5,825 00	136 11
Agricultural economics, ...	112 60	—	50 00	—62 60
Agricultural education, ...	5,047 21	15 91	5,000 00	—31 30
Botanical, ...	994 05	259 34	700 00	—34 71
Chemical, ...	2,137 73	2,075 14	1,000 00	937 41
Dean's office, ...	232 36	36	200 00	—32 00
Entomology, ...	515 29	251 61	725 00	461 32
English, ...	539 69	1 00	855 00	316 31
Extension department, ...	12,336 03	1,745 63	8,125 00	—2,465 40 ✓
Floriculture, ...	2,987 80	2,495 93	1,250 00	758 13
General horticulture, ...	2,436 18	805 51	1,800 00	169 33
General maintenance, ...	32,405 40	10,739 37	30,700 00	9,033 97
Graduate school, ...	1,413 19	—	2,500 00	1,086 81
Grounds, ...	1,444 30	54 10	1,200 00	—190 20
Library, ...	5,083 89	567 51	4,575 00	58 62
Landscape gardening, ...	258 21	123 90	100 00	—34 31
Market gardening, ...	4,970 60	2,604 94	2,100 00	—265 66
Mathematics and physics, ...	251 74	1 12	400 00	149 38
Military, ...	1,657 52	53 25	1,500 00	—104 27
Options on land, ...	125 00	115 00	—	—10 00
Physical education, ...	566 41	137 85	530 00	101 44
Political science, ...	7 05	—	10 00	2 95
Pomology, ...	3,237 78	1,398 70	1,850 00	10 92
President's office, ...	721 91	15 25	800 00	93 34
Registrar, ...	249 12	—	300 00	50 88
Salaries, ...	71,124 91	143 32	70,950 00	—31 59
Treasurer's office, ...	753 75	34 69	675 00	—44 06
Veterinary, ...	777 42	5 90	1,542 97 ²	771 45
Zoological, ...	392 73	275 41	20 00	—97 32
State Treasurer: —				
Endowment fund, ...	—	10,613 32	—	—
Instruction fund, ...	—	40,000 00	—	—
Maintenance fund, ...	—	33,000 00	—	—
Student labor fund, ...	—	7,500 00	—	—
Scholarship fund, ...	—	15,000 00	—	—
Extension department, ...	—	8,125 00	—	—
Agricultural education, ...	—	5,000 00	—	—
Veterinary, ...	—	1,000 00	—	—
Graduate school, ...	—	2,500 00	—	—
United States Treasurer: —				
Morrill fund, ...	—	16,666 67	—	—
Nelson fund, ...	—	13,333 33	—	—
Balance beginning fiscal year, Dec. 1, 1909, ...	\$182,693 14	\$193,029 03	\$150,292 97	\$14,449 33
Balance on hand Nov. 30, 1910, ...	22,055 78	11,719 89	—	—6,558 86
	\$204,748 92	\$204,748 92	\$150,292 97	\$7,890 47

¹ Architects' fees are on account of the cost of the preparation of plans and specifications for use of Legislature, but on account of no appropriation being made this expense was paid from the current funds.

² Includes balance brought forward Dec. 1, 1909, \$542.97.

Summary.

	Disbursements.	Receipts.
By cash on hand Dec. 1, 1909, ...	-	\$11,719 89
By institution receipts Nov. 30, 1910, ...	-	40,290 71
By State Treasurer receipts Nov. 30, 1910, ...	-	122,738 32
By United States Treasurer receipts Nov. 30, 1910, ...	-	30,000 00
To total disbursements Nov. 30, 1910, ...	\$182,693 14	-
Bills receivable Dec. 1, 1909, deducted, ...	\$182,693 14	\$204,748 92
Bills payable Dec. 1, 1909, deducted, ...	1,724 68	4,558 07
	\$180,968 46	\$200,190 85
Bills receivable Nov. 30, 1910, ...	-	2,187 72
Bills payable Nov. 30, 1910, ...	1,668 77	-
Balance, ...	19,741 34	-
	\$202,378 57	\$202,378 57

Comparative Disbursements and Receipts for 1909-10.

ACCOUNTS.	DISBURSEMENTS.		RECEIPTS.	
	1909.	1910.	1909.	1910.
Architects' fees, ...	-	\$3,155 44	-	-
Administration, ...	\$5,041 39	4,729 04	\$173 15	\$30 07
Agriculture, ...	19,697 34	22,028 79	14,271 77	10,339 90
Agricultural economics, ...	6 95	112 60	-	-
Agricultural education, ...	5,204 17	5,047 21	13 90	15 91
Botanical, ...	1,320 99	994 05	611 90	259 34
Chemical, ...	3,152 00	2,137 73	1,775 82	2,075 14
Dean's office, ...	201 17	232 36	-	36
Entomology, ...	651 31	515 29	224 87	251 61
English, ...	372 37	539 69	-	1 00
Extension work, ...	6,206 95	12,336 03	1,475 27	1,745 63
Floriculture, ...	2,398 65	2,987 80	1,484 65	2,495 93
Farm fire, ...	-	-	2,469 64	-
General horticulture, ...	2,992 94	2,436 18	1,183 34	805 51
General maintenance, ...	33,518 04	32,405 40	11,162 75	10,739 37
Graduate school, ...	397 68	1,413 19	-	-
Grounds, ...	1,474 61	1,444 30	16 30	54 10
Library, ...	3,659 38	5,083 89	422 48	567 51
Landscape gardening, ...	231 62	258 21	162 00	123 90
Market gardening, ...	4,775 49	4,970 60	2,914 03	2,604 94
Mathematics and physics, ...	251 71	251 74	-	1 12
Meteorology, ...	65 20	-	-	-
Military, ...	943 75	1,657 52	126 87	53 25
Options on land, ...	-	125 00	-	115 00
Physical education, ...	149 77	566 41	-	137 85
Political science, ...	-	7 05	-	-
Pomology, ...	2,943 64	3,237 78	1,472 29	1,398 70
President's office, ...	832 58	721 91	63 29	15 25
Registrar, ...	176 61	249 12	-	-
Salaries, ...	63,353 96	71,124 91	-	143 32
Treasurer's office, ...	492 18	753 75	24 27	34 69
Veterinary, ...	1,042 00	777 42	148 00	5 90
Zoölogical, ...	237 97	392 73	322 60	275 41
State Treasurer:—				
Agricultural education, ...	-	-	6,250 00	5,000 00
Endowment fund, ...	-	-	10,613 32	10,613 32
Graduate school, ...	-	-	-	2,500 00
Heat and light, ...	-	-	625 00	-
Instruction, ...	-	-	35,750 00	40,000 00
Maintenance, ...	-	-	15,000 00	33,000 00
Extension department, ...	-	-	6,250 00	8,125 00
Scholarship fund, ...	-	-	18,750 00	15,000 00
Student labor, ...	-	-	-	7,500 00
Veterinary, ...	-	-	1,250 00	1,000 00
United States Treasurer:—				
Morrill fund, ...	-	-	16,666 67	16,666 67
Nelson fund, ...	-	-	10,000 00	13,333 33
	\$161,792 42	\$182,693 14	\$161,674 18	\$193,029 03
Balance beginning fiscal year, ...	-	-	11,838 13	11,719 89
Balance at close, ...	11,719 89	22,055 78	-	-
	\$173,512 31	\$204,748 92	\$173,512 31	\$204,748 92

EXPERIMENT STATION.

Disbursements and Receipts.

ACCOUNTS.	Disbursements from Dec. 1, 1909, to Nov. 30, 1910.	Receipts from Dec. 1, 1909, to Nov. 30, 1910.	Apportionment for Year ending Nov. 30, 1910.	Balance to Credit.
Administration, ...	\$1,722 57	\$32 80	\$2,000 00	\$310 23
Agricultural, ...	5,286 14	2,963 67	2,500 00	177 53
Asparagus, ...	736 59	—	700 00	—36 59
Botanical, ...	1,283 19	28 70	1,600 00	345 51
Chemical, ...	9,228 13	6,660 08	2,800 00	231 90
Cranberry, ...	1,504 29	1,958 54	1,000 00	1,454 25
Entomological, ...	562 81	1 20	800 00	238 39
Fertilizer, ...	—	5,880 00	—	5,880 00
Freight, ...	445 03	85	500 00	55 82
Graves orchard, ...	350 81	119 00	300 00	68 19
Horticultural, ...	1,530 18	2 37	1,450 00	—77 81
Library, ...	289 62	—	300 00	10 38
Meteorology, ...	299 03	—	300 00	97
Publications, ...	1,953 86	—	3,200 00	1,246 14
Salaries, ...	31,438 00	15 52	31,825 36	402 88
Treasurer's office, ...	370 74	—	400 00	29 26
Veterinary, ...	218 64	—	250 00	31 36
Hatch fund, ...	—	15,000 00	—	—
Adams fund, ...	—	14,000 00	—	—
State fund, ...	—	10,500 00	—	—
Feed law, ...	3,580 61	3,000 00	5,148 50	1,567 89
Cranberry association, ¹	544 17	544 17	—	—
Expert services, ...	12 40	85 00	—	72 60
Tobacco investigations, ...	317 78	—	400 00	82 22
	\$61,674 64	\$60,791 90	\$55,473 86	\$12,205 52
Balance beginning fiscal year, Dec. 1, 1909, ...	—	6,682 68	—	—114 40
Balance on hand Nov. 30, 1910, ...	5,799 94	—	—	—
	\$67,474 58	\$67,474 58	\$55,473 86	\$12,091 12

¹ Transferred to cranberry growers' contribution account.*Experiment Station Trust Fund.*

Account.	Disbursements for Year ending Nov. 30, 1910.	Receipts for Year ending Nov. 30, 1910.	Balance on Hand.
Cranberry growers' contribution,	\$471 47	\$728 87	\$257 40

Comparative Disbursements and Receipts for 1909-10.

ACCOUNTS.	DISBURSEMENTS.		RECEIPTS.	
	1909.	1910.	1909.	1910.
Administration, ...	\$2,065 20	\$1,722 57	\$47 35	\$32 80
Agricultural, ...	4,578 09	5,286 14	2,010 46	2,963 67
Asparagus, ...	715 60	736 59	—	—
Botanical, ...	1,617 96	1,283 19	44 13	28 70
Chemical, ...	9,403 73	9,228 13	4,809 38	6,660 08
Cranberry, ...	459 56	1,504 29	—	1,958 54
Entomological, ...	495 58	562 81	—	1 20
Fertilizer, ...	—	—	5,505 00	5,880 00
Freight, ...	499 91	445 03	15 29	85
Graves orchard, ...	281 10	350 81	—	119 00
Horticultural, ...	1,719 44	1,530 18	1 15	2 37

Comparative Disbursements and Receipts for 1909-10 — Concluded.

ACCOUNTS.	DISBURSEMENTS.		RECEIPTS.	
	1909.	1910.	1909.	1910.
Library, ...	\$343 11	\$289 62	\$8 87	-
Meteorology, ...	308 05	299 03	-	-
Publications, ...	2,031 81	1,953 86	107 98	-
Salaries, ...	27,842 23	31,438 00	153 08	\$15 52
Treasurer's Office, ...	319 82	370 74	-	-
Veterinary, ...	231 71	218 64	-	-
Hatch fund, ...	-	-	15,000 00	15,000 00
Adams fund, ...	-	-	12,000 00	14,000 00
State fund, ...	-	-	13,125 00	10,500 00
Feed law, ...	3,011 51	3,580 61	4,500 00	3,000 00
Repairs, ...	1 30	-	-	-
Cranberry Association, ¹	-	544 17	-	544 17
Expert services, ...	-	12 40	-	85 00
Tobacco investigations, ...	-	317 78	-	-
	\$55,925 71	\$61,674 64	\$57,327 69	\$60,791 90
Balance beginning fiscal year, ...	-	-	5,280 70	6,682 68
Balance on hand Nov. 30, 1910, ...	6,682 68	5,799 94	-	-
	\$62,608 39	\$67,474 58	\$62,608 39	\$67,474 58

¹ Transferred to cranberry growers' contribution account.

AGRICULTURAL DIVISION.

Disbursements and Receipts for Fiscal Year ending Nov. 30, 1910.

	Disbursements.	Receipts.
<i>Academic.</i>		
Maintenance, ...	\$99 74	\$0 64
Equipment, ...	114 99	7 76
Student labor, ...	133 11	45
Miscellaneous, ...	140 76	1 50
Department totals, ...	\$488 60	\$10 35
Office, ...	\$215 55	\$22 79
<i>Farm.</i>		
Labor, ...	\$9,378 12	\$3,139 52
Dairy, ...	1,568 73	3,839 85
Teams, ...	1,353 26	27 00
Cattle, ...	4,559 02	7,352 65
Horses, ...	494 92	57 50
Swine, ...	213 25	377 47
Field Crops, ...	1,180 45	1,444 97
Repairs, ...	268 11	-
Improvements, ...	178 62	46 80
Student labor, ...	1,719 83	11 25
Sundry, ...	142 29	9 75
Tools, ...	268 04	-
Department totals, ...	\$21,324 64	\$16,306 76
Division totals, ...	\$22,028 79	\$16,339 90

AGRICULTURAL DIVISION — *Concluded.**Summary.*

	Dr.	Cr.
By total division receipts, ...		\$16,339 90
By bills receivable, ...		1,136 49
By net apportionment, ...		5,825 00
To total disbursements, ...	\$22,028 79	
To bills payable, ...	499 74	
To balance, ...	772 86	
	\$23,301 39	\$23,301 39

Inventory of Quick Assets.

	Nov. 30, 1909.	Nov. 30, 1910.
Inventory of produce, ...	\$3,219 93	\$4,999 13
Inventory of cattle, ...	8,155 00	10,042 00
Inventory of swine, ...	182 00	340 00
Inventory of horses, ...	4,375 00	4,400 00
	\$15,931 93	\$19,781 13

HORTICULTURAL DIVISION.

Disbursements and Receipts for Fiscal Year ending Nov. 30, 1910.

	Disbursements.	Receipts.
Market gardening, ...	\$4,970 60	\$2,604 94
General horticulture, ...	2,436 18	805 51
Floriculture, ...	2,987 80	2,495 93
Pomology, ...	3,237 78	1,398 70
Landscape gardening, ...	258 21	123 90
Totals, ...	\$13,890 57	\$7,428 98

Summary.

	Dr.	Cr.
By total division receipts, ...		\$7,428 98
By bills receivable, ...		883 70
By apportionment, ...		7,100 00
To total division disbursements, ...	\$13,890 57	
To total division bills payable, ...	122 93	
To balance unexpended, ...	1,399 18	
	\$15,412 68	\$15,412 68

Inventory of Quick Assets.

	Nov. 30, 1909.	Nov. 30, 1910.
Inventory of produce, ...	\$410 40	\$496 00

INVENTORY — REAL ESTATE.

Land (Estimated Value).

Baker place, ...	\$2,500 00	
Bangs place, ...	2,350 00	
Clark place, ...	4,500 00	
College farm, ...	37,000 00	
Harlow farm, ...	3,284 63	
Kellogg farm, ...	5,868 45	
Louisa Baker place, ...	5,636 91	
Old creamery place, ...	1,726 25	
Pelham quarry, ...	500 00	
Westcott place, ...	2,250 00	
Allen place, ...	500 00	
Charmbury place, ...	450 00	
Loomis place, ...	415 00	
Hawley & Brown place, ...	675 00	\$67,656 24

College Buildings (Estimated Value).

Chemical laboratory, ...	\$8,200 00	
Clark hall, ...	67,400 00	
Dining hall, ...	35,450 00	
Drill hall, ...	7,000 00	
Durfee plant house and fixtures, ...	10,000 00	
Dwelling houses purchased with farm, ...	5,100 00	
Entomology building, ...	80,000 00	
Farmhouse, ...	2,050 00	
French hall, ...	17,000 00	
Glass house range, ...	15,000 00	
Graves house and barn, ...	1,560 00	
Gun shed and bath room, ...	2,500 00	
Hay storage barn and silo, ...	30,000 00	
Horse barn, ...	5,020 00	
Horticultural barn, ...	2,525 00	
Insectary, ...	5,800 00	
Mathematical building, ...	5,600 00	
North dormitory, ...	25,400 00	
Power house, ...	13,000 00	
Powder house, ...	75 00	
President's house, ...	12,000 00	
Small plant house, with vegetable cellar and cold grapery, ...	4,700 00	
South dormitory, ...	35,500 00	
Stone chapel, ...	30,225 00	
Tool house, ...	2,000 00	
Veterinary laboratory and stable, ...	22,995 60	
Wilder Hall, ...	37,300 00	
Young stock barn, ...	6,500 00	
		489,900 60
Amount carried forward, ...		\$557,556 84

College Equipment (Estimated Value).

<i>Amount brought forward,</i>	\$557,556 84
Agricultural division: —	
Academic, ...	\$3,742 14
Dairy school, ...	1,735 14
Farm, ...	27,053 84
Agricultural education, ...	607 21
Botanical department, ...	7,468 47
Chemical laboratory, ...	4,634 50
College supplies, ...	146 05
Dean's office, ...	277 80
Dining hall, ...	3,029 63
Entomological laboratory, ...	4,158 15
Extension department, ...	952 05
Fire apparatus, ...	623 20
Floriculture, ...	5,690 73
General horticulture, ...	8,603 55
General maintenance, ...	64,369 57
Landscape gardening, ...	4,286 65
Language and literature, ...	189 01
Library, ...	54,679 55
Market gardening, ...	699 00
Military, ...	1,153 80
Pomology, ...	1,335 43
Physical education, ...	2,136 04
Physics and mathematics, ...	5,679 50
President's office, ...	938 83
Registrar's office, ...	292 20
Treasurer's office, ...	926 00
Trophy room, ...	1,273 85
Veterinary laboratory, ...	7,879 97
Water mains, ...	7,810 00
Zoölogical laboratory, ...	8,647 79
Zoölogical museum, ...	5,689 73
	236,709 38

Experiment Station Buildings (Estimated Value).

Agricultural laboratory, ...	\$9,000 00	
Chemical laboratory (plant and animal chemistry), ...	20,000 00	
Entomological laboratory, ...	850 00	
		29,850 00

Experiment Station Equipment (Estimated Value).

Agricultural laboratory,	.	.	.	.	.	\$7,303 65	
Botanical laboratory,	.	.	.	.	.	4,193 44	
Chemical laboratory,	.	.	.	.	.	19,661 18	
Director's office,	.	.	.	.	.	3,200 50	
Entomological laboratory,	.	.	.	.	.	21,904 15	
Horticultural laboratory,	.	.	.	.	.	1,058 20	
Meteorology laboratory,	.	.	.	.	.	1,304 80	
Treasurer's office,	.	.	.	.	.	480 50	
							59,106 42
							\$883,222 64

Inventory Summary.

Land, ...	\$67,656 24
College buildings, ...	489,900 60
College equipment, ...	236,709 38
Experiment station buildings, ...	29,850 00
Experiment station equipment, ...	59,106 42
	\$883,222 64

STUDENTS' TRUST FUNDS ACCOUNTS.

ACCOUNTS.	Disburse- ments for Year ending Nov. 30, 1910.	Receipts for Year ending Nov. 30, 1910.	Balance brought for- ward Dec. 1, 1909.	Balance on Hand Nov. 30, 1910.
Athletics, ...	\$2,116 88	\$4,676 79	\$10 00	\$2,569 91
Dining hall, ...	41,698 17	40,910 28	—5,658 36	—6,446 25
College signal, ...	1,549 98	1,629 86	333 20	413 08
Keys, ...	48 25	43 50	33 75	29 00
Creamery house, ...	167 76	184 43	24 54	41 21
Student deposits, ...	3,539 42	3,266 15	447 63	174 36
Harlow farm, ...	287 78	302 77	—42 51	—27 52
Trophy room tax, ...	790 99	702 97	364 25	276 23
Kellogg farm, ...	327 21	417 75	—22 42	68 12
Text-books, ...	3,627 19	3,577 56	1,154 22	1,104 59
Uniforms, ...	1,551 28	1,755 20	1,527 78	1,731 70
Musical association, ...	72 46	79 53	23 75	30 82
Louisa Baker farm, ...	—	25 00	188 14	213 14
Balance on hand Dec. 1, 1909, ...	\$55,777 37	\$57,571 79	—\$5,723 29	\$6,652 16
Balance on hand Nov. 30, 1910, ...	1,616 03	—	4,107 26	—6 473 77
	—	178 39	—	—
	\$57,393 40	\$57,393 40	—\$1,616 03	\$178 39

DETAILED STATEMENT OF DINING HALL.

	Liabilities.	Resources.
Dec. 1, 1909, cash overdraft, ...	\$5,658 36	—
Nov. 30, 1910, provisions purchased, ...	41,698 17	—
Nov. 30, 1910, outstanding bills, ...	1,224 11	—
Nov. 30, 1910, total collections, ...	—	\$40,910 28
Nov. 30, 1910, total collections outstanding, ...	—	2,856 26
Nov. 30, 1910, inventory, ...	—	2,922 89
Balance, ...	—	1,891 21
	\$48,580 64	\$48,580 64

ENDOWMENT FUND.¹

	Principal.	Income.
United States grant (5 per cent.), ...	\$219,000 00	\$7,300 00
Commonwealth grant (3½ per cent.), ...	142,000 00	3,313 32
		\$10,613 32

¹ This fund is in the hands of the State Treasurer, and the Massachusetts Agricultural College receives two-thirds of the income from the same.

BENEFICIARY FUNDS.

Burnham Emergency Fund.

	Market Value Dec. 1, 1910.	Par Value.	Income.
Two Lake Shore & Michigan Southern Railroad gold notes, at \$1,000,*	-	\$2,000 00	\$50 00
Two bonds American Telephone and Telegraph Company 4s, at \$910.	\$1,820 00	2,000 00	80 00
Two bonds Western Electric Company 5s, at \$1,000, . . .	2,000 00	2,000 00	50 00
One bond United Fruit Company 5s, ...	1,010 00	1,000 00	50 00
	\$4,830 00	\$7,000 00	\$230 00
*On Feb. 1, 1910: —			
Two Lake Shore & Michigan Southern Rail- road bonds were sold for . . . \$2,000 00	-	-2,000 00	-
Two Western Electric Company bonds were purchased for 1,996 67	-	-	3 33
Unexpended balance Dec., 1909, ...	-	-	382 62
	\$4,830 00	\$5,000 00	\$615 95
Disbursements for fiscal year ending Nov. 30, 1910, . . .	-	-	215 05
Cash on hand Dec. 1, 1910, ...	-	-	\$400 90

Library Fund.

Five bonds Lake Shore & Michigan Southern Railroad Company 4s, at \$93½,	\$4,675 00	\$5,000 00	\$200 00
Five bonds New York Central & Hudson River Railroad Company 4s, at \$93½,	4,675 00	5,000 00	200 00
Two shares New York Central & Hudson River Railroad Company stock, at \$112, ...	224 00	200 00	11 50
Sale of rights of New York Central & Hudson River Rail- road Company stock, ...	-	-	12 90
Amherst Savings Bank, deposit, ...	167 77	167 77	6 68
	\$9,741 77	\$10,367 77	\$431 08
Transferred to college library account, ...	-	-	431 08

SPECIAL FUNDS.

Endowed Labor Fund (the Gift of a Friend of the College).

	Market Value Dec. 1, 1910.	Par Value.	Income.
Two bonds American Telephone and Telegraph Company 4s, at \$93½,	\$1,870 00	\$2,000 00	\$80 00
Two bonds Lake Shore & Michigan Southern Railroad Company 4s, at \$93½,	1,870 00	2,000 00	80 00
One bond New York Central Railroad debenture 4s, . . .	935 00	1,000 00	40 00
Amherst Savings Bank, deposit, ...	143 39	143 39	5 72
	\$4,818 39	\$5,143 39	\$205 72
Gift of a friend, Hon. Lucius Tuttle, ...	-	-	100 00
Unexpended balance Dec. 1, 1909, ...	-	-	680 67
Cash on hand Dec. 1, 1910, ...	-	-	\$986 39

SPECIAL FUNDS — *Continued.**Whiting Street Scholarship Fund.*

	Market Value Dec. 1, 1910.	Par Value.	Income.
One bond New York Central debenture 4s, ...	\$935 00	\$1,000 00	\$40 00
Amherst Savings Bank, deposit, ...	271 64	271 64	10 84
	\$1,206 64	\$1,271 64	\$50 84
Unexpended balance Dec. 1, 1909, ...	—	—	36 79
			\$87 63
Disbursements for scholarships for fiscal year ending Nov. 30, 1910, ...	—	—	30 00
Cash on hand Dec. 1, 1910, ...	—	—	\$57 63

Hills Fund.

Northampton Institution for Savings, deposit, ...	\$1,180 00	\$1,180 00	\$44 66
One bond American Telephone and Telegraph Company 4s, ...	910 00	1,000 00	40 00
One bond New York Central & Hudson River Railroad debenture 4s, ...	935 00	1,000 00	40 00
One bond New York Central & Hudson River Railroad Company 3½s, ...	840 00	1,000 00	35 00
One bond New York Central & Hudson River Railroad gold note, 5 per cent.,*	—	1,000 00	25 00
One bond Western Electric Company 5s, ...	1,000 00	1,000 00	25 00
One bond Metropolitan Street Railway, Kansas City, 5 per cent., ...	980 00	1,000 00	50 00
Three bonds Pacific Telephone and Telegraph Company 5s, at \$98, ...	2,940 00	3,000 00	150 00
Exchange on Metropolitan Street Railway bond, ...	—	—	20 00
Boston & Albany Railroad stocks, at \$224, ...	812 00	362 00	31 68
Amherst Savings Bank, deposit, ...	72 75	72 75	2 88
	\$9,669 75	\$10,614 75	\$464 22
*On Feb. 1, 1910: —			
One New York Central & Hudson River gold note was sold for	\$1,000 00	—1,000 00	—
One bond Western Electric Company 5s was purchased for	998 33	—	1 67
Unexpended balance Dec. 1, 1909, ...	—	—	379 70
	\$9,669 75	\$9,614 75	\$845 59
Disbursements by horticultural and botanical depart- ments for fiscal year ending Nov. 30, 1910, ...	—	—	227 13
Cash on hand Dec. 1, 1910, ...	—	—	\$618 46

Mary Robinson Fund.

Northampton Institution for Savings, deposit, ...	\$820 00	\$820 00	\$31 04
Boston & Albany Railroad stock, at \$224, ...	84 00	38 00	3 32
	\$904 00	\$858 00	\$34 36
Unexpended balance Dec. 1, 1909, ...	—	—	21 17
Cash on hand Dec. 1, 1910, ...	—	—	\$55 53

SPECIAL FUNDS—*Concluded.**Grinnell Prize Fund.*

	Market Value Dec. 1, 1910.	Par Value.	Income.
Ten shares New York Central & Hudson River Railroad stock,	\$1,120 00	\$1,000 00	\$57 50
Sale of rights of New York Central & Hudson River Rail- road Company's stock, ...	—	—	64 50
Unexpended balance Dec. 1, 1909, ...	—	—	\$122 00 121 24
Disbursements for prizes, ...	—	—	\$243 24 50 00
Cash on hand Dec. 1, 1910, ...	—	—	\$193 24

Gassett Scholarship Fund.

One bond New York Central debenture 4s, at \$93½, . . .	\$935 00	\$1,000 00	\$40 00
Amherst Savings Bank, deposit, ...	11 64	11 64	44
Unexpended balance Dec. 1, 1909, ...	\$946 64 —	\$1,011 64 —	\$40 44 33 43
Disbursements for scholarships for fiscal year ending Nov. 30, 1910, ...	—	—	\$73 87 37 50
Cash on hand Dec. 1, 1910, ...	—	—	\$36 37

Massachusetts Agricultural College (Investment).

One share New York Central & Hudson River Railroad stock,	\$112 00	\$100 00	\$5 75
Sale of rights of New York Central & Hudson River Rail- road Company's stock, ...	—	—	6 45
Unexpended balance Dec. 1, 1909, ...	—	—	\$12 20 38 00
Cash on hand Dec. 1, 1910, ...	—	—	\$50 20

Danforth Keyes Bangs Fund.

Two bonds Pacific Telephone and Telegraph Company 5s, at \$98,	\$1,960 00	\$2,000 00	\$100 00
Two bonds American Telephone and Telegraph Company 4s, at \$91,	1,820 00	2,000 00	80 00
Two bonds Union Electric Light and Power Company 5s, at \$99,	1,980 00	2,000 00	100 00
Interest received from loan, ...	—	—	1 25
Unexpended balance Dec. 1, 1909, ...	\$5,760 00 —	\$6,000 00 —	\$281 25 234 04
Loan to students outstanding, ...	—	—	\$515 29 170 00
Cash on hand Dec. 1, 1910, ...	—	—	\$345 29

John C. Cutter Fund.

	Market Value Dec. 1, 1910.	Par Value.	Income.
One bond Pacific Telephone and Telegraph Company 5s, at \$98,*	\$980 00	\$1,000 00	\$25 00
*Amount of John C. Cutter fund, . . . \$1,000 00	-	-	-
One Pacific Telephone and Telegraph bond, . . . 996 67	-	-	3 33
Cash on hand Dec. 1, 1910, ...	-	-	\$28 33

SUMMARY OF BALANCES ON HAND OF THE INCOME FROM FUNDS HELD IN
TRUST BY THE MASSACHUSETTS AGRICULTURAL COLLEGE.

Burnham emergency fund, ...	\$400 90
Endowed labor fund, ...	986 39
Whiting Street scholarship fund, ...	57 63
Hills fund, ...	618 46
Mary Robinson fund, ...	55 53
Grinnell prize fund, ...	193 24
Gassett scholarship fund, ...	36 37
Massachusetts Agricultural College investment, ...	50 20
Danforth Keyes Bangs fund, ...	345 29
John C. Cutter fund, ...	28 33
	\$2,772 34

I hereby certify that I have this day examined the Massachusetts Agricultural College account, as reported by the treasurer, Fred C. Kenney, for the year ending Nov. 30, 1910. All bonds and investments are as represented in the treasurer's report. All disbursements are properly vouched for, and all cash balances are found to be correct.

CHARLES A. GLEASON,
Auditor.

AMHERST, Dec. 12, 1910.

HISTORY OF SPECIAL FUNDS.

Burnham emergency fund:—

A bequest from T. O. H. P. Burnham of Boston, made without any conditions. The trustees of the college have voted that the fund be kept intact, and that the income from it be used for the college for such purposes as they believe to be for its best interest, \$5,000 00

Library fund:—

The library of the college at the present time contains about 30,000 volumes. The income from the fund raised by the alumni and others is devoted to its increase, and additions are made from time to time as the needs of the different departments require. Dec. 27, 1883, William Knowlton gave \$2,000; Jan. 1, 1894, Charles L. Flint gave \$1,000; in 1887 Elizur Smith of Lee, Mass., gave \$1,215. These were the largest bequests, and amount now to . . . 10,000 00

Endowed labor fund:—

Gift of a friend of the college in 1901, income of which is to be used for the assistance of needy and deserving students, ... \$5,000 00

Whiting Street scholarship:—

Gift of Whiting Street of Northampton, for no special purpose, but to be invested and the income used.
This fund is now used exclusively for scholarship, . . . 1,000 00

Hills fund:—

Gift of Leonard M. and Henry F. Hills, in 1867, to establish and maintain a botanic garden, . . . 10,000 00

Mary Robinson fund:—

Gift of Miss Mary Robinson of Medfield, in 1874, for scholarship, ... 1,000 00

Grinnell prize fund:—

Gift of Hon. Wm. Claflin, to be known as the Grinnell agricultural prize, to be given to the two members of the graduating class who may pass the best oral and written examination in theory and practice of agriculture, given in honor of George B. Grinnell of New York, ... 1,000 00

Gassett scholarship fund:—

Gift of Henry Gassett of Boston, the income to be used for scholarship, ... 1,000 00

Massachusetts Agricultural College investment fund:—

Investment made by vote of trustees, in 1893; to purchase one share New York Central & Hudson River Railroad stock. The income from this fund has been allowed to accumulate, ... 100 00

Danforth Keyes Bangs fund:—

Gift on account of the Louisa Baker estate, April 14, 1909, the income thereof to be used annually in aiding poor, industrious and deserving students to obtain an education in said college, ... 6,000 00

John C. Cutter fund:—

Gift of Dr. John C. Cutter, an alumnus of the college, who died in August, 1909, to be invested by the trustees, and the income to be annually used for the purchase of books on hygiene, ... 1,000 00

\$41,100 00

PRIZES.

Special prize, for best work done in entomology by under- graduates. This prize is given by the alumni ento- mologists, ...	\$30 00
Special prize, in honor of J. W. D. French, given by the Bay State Agricultural Society, for the best essay on forestry from the senior class, ...	25 00
Special prize, given by the Western Alumni Association to that member of the sophomore class who during his first two years has shown the greatest improvement in schol- arship, character and example, ...	25 00
	\$80 00

FRED C. KENNEY,

Treasurer.

THE M. A. C. BULLETIN

AMHERST, MASS.

Vol. III. No. 2.

For February, 1911.

Published Six Times a Year by the College.

Jan., Feb., Mar., May, Sept., Oct.

ENTERED AS SECOND-CLASS MAIL MATTER AT THE POST OFFICE, AMHERST, MASS.

Public Document

No. 31

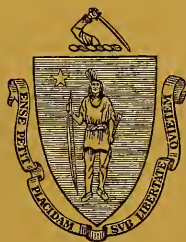
CATALOGUE

OF THE

MASSACHUSETTS AGRICULTURAL COLLEGE, 1910-1911.

FORTY-EIGHTH ANNUAL REPORT.

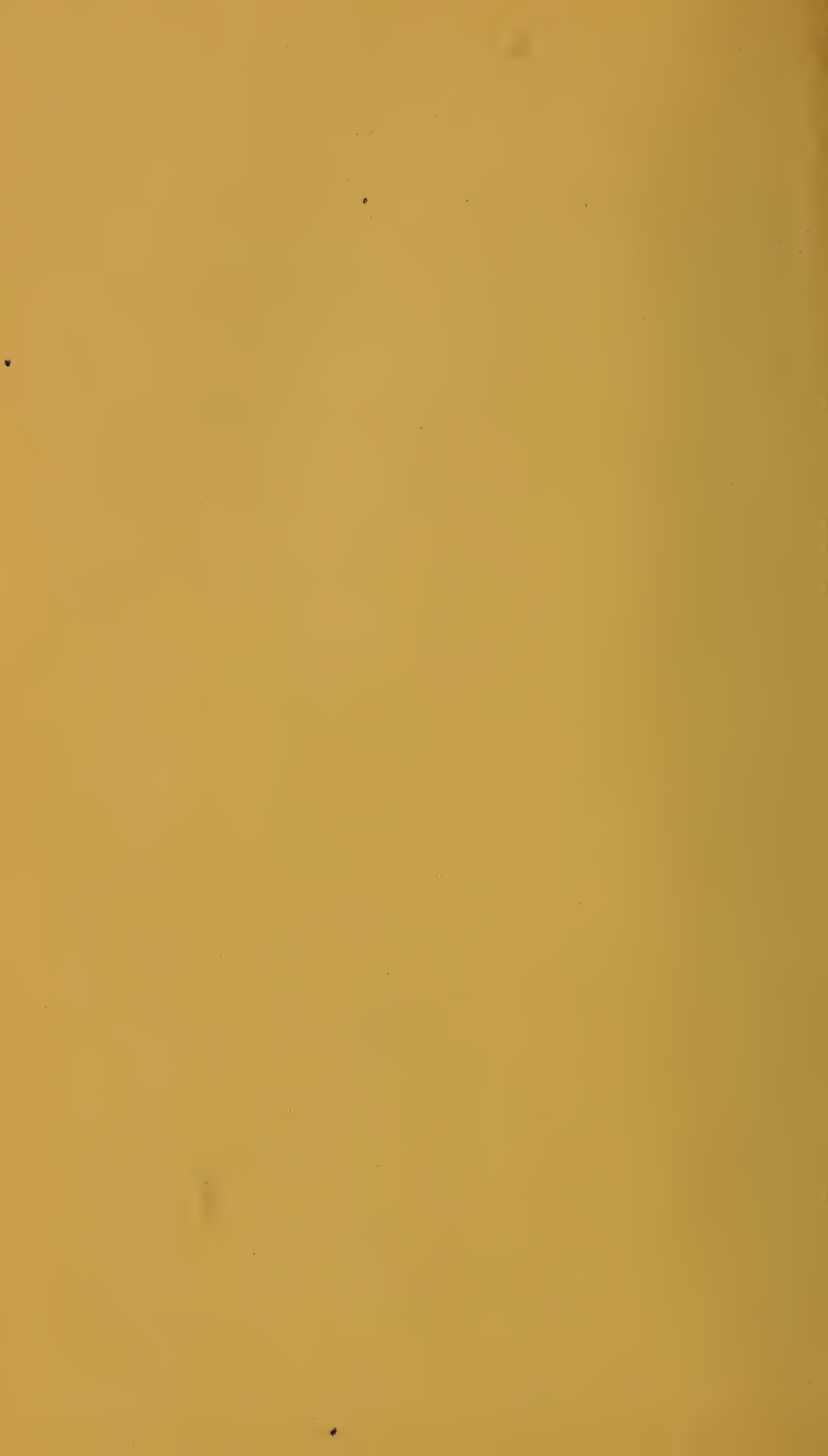
PART II.



BOSTON:

WRIGHT & POTTER PRINTING CO., STATE PRINTERS,
18 POST OFFICE SQUARE.

1911.



Without excluding other scientific and classical studies, and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts in such manner as the legislatures of the states may respectively prescribe, in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life.— *Act of Congress, July 2, 1862.*

MASSACHUSETTS AGRICULTURAL COLLEGE, AMHERST.

CATALOGUE, 1910-1911.



BOSTON:
WRIGHT & POTTER PRINTING CO., STATE PRINTERS,
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1911.

APPROVED BY
THE STATE BOARD OF PUBLICATION.

Vacations and holidays are indicated by light-faced type.

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THE MASSACHUSETTS
AGRICULTURAL COLLEGE.

Beginning with this issue, the catalogue represents a statement of the courses of study, and the status of the college, for the current college year, unless the contrary is indicated in the text. Announcement of changes affecting the work of the following year will be made later.

CALENDAR.

1911-1912.

REGULAR COURSES.

1911.

January 2, Monday, 1 P.M., . . .	Winter recess ends; chapel.
January 30, Monday, . . .	Semester examinations begin.
February 6, Monday, 1 P.M., . . .	Second semester begins; chapel.
February 22, Wednesday, . . .	Half holiday, Washington's Birth-day.
March 24, Friday, 6 P.M., . . .	Spring recess begins.
April 3, Monday, 1 P.M., . . .	Spring recess ends; chapel.
April 19, Wednesday, . . .	Half holiday, Patriot's Day.
May 30, Tuesday, . . .	Holiday, Memorial Day.
June 5, Monday, . . .	Senior examinations begin.
June 12, Monday, . . .	Non-senior examinations begin.
June 17-21, Saturday-Wednesday, . . .	Commencement.
June 21-24, Wednesday-Saturday, . . .	Entrance examinations.

Summer Vacation.

September 11-13, Monday-Wednesday, . . .	Condition examinations.
September 11-14, Monday-Thursday, . . .	Entrance examinations.
September 13, Wednesday, 1.30 P.M., . . .	First semester begins; assembly.
October 12, Thursday, . . .	Half holiday, Columbus Day.
November 29-December 4, Wednesday, 1 P.M.-Monday, 1 P.M., chapel, . . .	Thanksgiving recess.
December 15, Friday, 6 P.M., . . .	Winter recess begins.

1912.

January 1, Monday, 1 P.M., . . .	Winter recess ends; chapel.
January 29, Monday, . . .	Semester examinations begin.
February 5, Monday, 1 P.M., . . .	Second semester begins; chapel.
February 22, Thursday, . . .	Half holiday, Washington's Birth-day.
March 29, Friday, 6 P.M., . . .	Spring recess begins.
April 8, Monday, 1 P.M., . . .	Spring recess ends; chapel.
April 19, Friday, . . .	Half holiday, Patriot's Day.
May 30, Thursday, . . .	Holiday, Memorial Day.
June 3, Monday, . . .	Senior examinations begin.
June 10, Monday, . . .	Non-senior examinations begin.
June 15-19, Saturday-Wednesday, . . .	Commencement.
June 19-22, Wednesday-Saturday, . . .	Entrance examinations.

SHORT COURSES, 1911.

Ten weeks' general course, January 3-March 10.

Two weeks' course in poultry management, February 26-March 10.

Farmers' week, March 13-March 17.

Beekeeping course, May 24-June 7.

Summer school begins July 3.

ERRATA AND ADDENDA.

Page 15. — After "Guy Chester Crampton," insert "J. C. Graham, B.Sc., Associate Professor of Poultry Husbandry, beginning Feb. 15, 1911."

Page 16. — "Marcus T. Smulyan" (not Smulyou); the name should appear under "Graduate Assistants."

Page 17. — Under "Additional Instructors," omit name of "J. W. Wellman."

Pages 41, 42. — The tables state inaccurately the credits in freshman, sophomore and junior physical education and military science. These credits should be:—

Freshman Year. — Semester 1: Drill, 1 hour. Semester 2: Drill, 1 hour; Physical Education, 1 hour.

Sophomore and Junior Year (Each). — Semester 1: Drill, 1 hour; Tactics, 1 hour. Semester 2: Drill, 1 hour; Tactics, 1 hour; Physical Education, 1 hour.

The footings of the credit-hour columns should therefore read:—

Freshman Year. — Semester 1, 18 or 19.

Sophomore Year. — Semester 2, 20 or 18.

Page 57. — *Department of Entomology.* In name-list, after "Professor Fernald," insert "Associate Professor Crampton."

Page 64, footnote 2. — Add "Stephen Hamblin (second semester)."

Page 79. — *Department of Rural Social Science.* To name-list add "Mr. Holcomb."

Page 82. — *Department of Veterinary Science.* To name-list add "Mr. Larsen."

MASSACHUSETTS AGRICULTURAL COLLEGE.

HISTORY. — The Massachusetts Agricultural College was among the colleges organized under the national land grant act of 1862. This act gave public lands to the several States and Territories for the establishment of colleges for the benefit of agriculture and the mechanic arts; it was framed by the late Senator Justin Smith Morrill of Vermont. For our own college, liberal appropriations are also made by the Legislature of Massachusetts.

The college was incorporated in 1863, and on the 2d of October, 1867, was formally opened to an entering class of 33. In January, 1875, an arrangement was made with the authorities of Boston University under which the college, without losing its independence, became the school of agriculture of the university. Under this arrangement, graduates of the Massachusetts Agricultural College may, upon certain conditions, receive the diploma in science awarded to graduates of the university. In 1882 the State experiment station was located at the college. It has since been incorporated with the college.

COURSES. — The college offers a free education to any American student who may fulfill the requirements of admission. Women are admitted on the same standing as men. Foreign students pay a tuition fee. The four-years course leads to the degree of bachelor of science, and graduate courses are given leading to the degrees of master of science and of doctor of philosophy. Winter courses of ten weeks are offered, and, upon announcement, special courses. There is also a summer school of agriculture, designed chiefly for persons desiring to teach agriculture in the elementary and high schools.

PURPOSE OF THE COLLEGE. — The chief purpose of the college is to prepare men and women for the agricultural vocations. In this statement, the term "agricultural" is used in the broadest sense. Courses are offered which give efficiency in various practical pursuits, such as general farming, dairying, the management of estates, fruit growing, glass farming, landscape gardening, forestry and arboriculture. Students also qualify for positions in institutions designed for investigation in the many sciences underlying

the great agricultural industry, for teaching in agricultural colleges and high schools, and for business occupations having connection with the farm and needing expert service.

Though the agricultural vocations are thus the chief concern of the college, students also find the course one that fits them admirably for pursuits in which the sciences — particularly chemistry, physics, mathematics and engineering — are an essential preparation. Still other students find the course a splendid general education, without regard to future occupation. The course is well balanced; each student is required to study English, a modern foreign language, literature, political science and history.

LOCATION AND EQUIPMENT. — Situated in the beautiful town of Amherst, the college has an inspiring outlook. The campus is especially attractive. The grounds comprise more than 475 acres, lying about a mile north of the village center. The equipment of the college, both in buildings and facilities for instruction, is excellent. Amherst, 97 miles west of Boston, is on the Central Vermont Railroad and the Central Massachusetts division of the Boston & Maine Railroad. Electric car lines connect the village with Northampton, Holyoke, Springfield and other cities. The town library is open to students, in addition to the college library, as are also good courses of lectures and concerts in the village, supplementing the various interests of college life.

THE MASSACHUSETTS AGRICULTURAL EXPERIMENT STATION.

Massachusetts provided for the establishment of an agricultural experiment station in 1882. This station, though on the college grounds and supported by the State, was without organic connection with the college. Under an act of Congress, passed in 1887, an agricultural experiment station was established as a department of the college. It was supported by the general government. For a time, therefore, Massachusetts had two experiment stations at the college. In 1894 these were combined, and the station reorganized as a department of the college. It is now supported by funds from both the State and the general government. In 1906 the general government largely increased its support of experiment stations, on condition, however, that the money thus provided should be used only for research. The station now receives about two-fifths of its support from the State.

The station is under the direct supervision of the Board of Trustees. The chief officer is the director, who is responsible to the president and to the committee of the Board. The station is organized into a number of departments, all co-operating toward the betterment of agriculture. In most cases the heads of the station departments are heads of corresponding departments in the college. The work of the station takes three directions; namely, control work, extension work and investigation. The station publishes numerous bulletins and two annual reports, one scientific, the other for practical farmers and for general distribution. These publications, conveying information as to results of experiments, are free, and circulate extensively, the mailing list containing some 20,000 addresses.

THE CORPORATION.

MEMBERS OF THE CORPORATION.

	TERM EXPIRES
DAVIS R. DEWEY of Cambridge, ...	1912
M. FAYETTE DICKINSON of Brookline, ...	1912
WILLIAM H. BOWKER of Concord, ...	1913
GEORGE H. ELLIS of West Newton, ...	1913
CHARLES E. WARD of Buckland, ...	1914
ELMER D. HOWE of Marlborough, ...	1914
NATHANIEL I. BOWDITCH of Framingham, ...	1915
WILLIAM WHEELER of Concord, ...	1915
ARTHUR G. POLLARD of Lowell, ...	1916
CHARLES A. GLEASON of New Braintree, ...	1916
FRANK GERRETT of Greenfield, ...	1917
HAROLD L. FROST of Arlington, ...	1917
CHARLES H. PRESTON of Danvers, ...	1918
FRANK A. HOSMER of Amherst, ...	1918

MEMBERS EX OFFICIO.

HIS EXCELLENCY GOVERNOR EUGENE N. FOSS, *President of the Corporation.*
 KENYON L. BUTTERFIELD, *President of the College.*
 DAVID SNEDDEN, *State Commissioner of Education.*
 J. LEWIS ELLSWORTH, *Secretary of the State Board of Agriculture.*

OFFICERS OF THE CORPORATION.

HIS EXCELLENCY GOVERNOR EUGENE N. FOSS of Boston, *President.*
 CHARLES A. GLEASON of Springfield, *Vice-President.*
 J. LEWIS ELLSWORTH of Worcester, *Secretary.*
 FRED C. KENNEY of Amherst, *Treasurer.*
 CHARLES A. GLEASON of Springfield, *Auditor.*

STANDING COMMITTEES OF THE CORPORATION.¹

Committee on Finance.

CHARLES A. GLEASON, <i>Chairman.</i>	ARTHUR G. POLLARD.
GEORGE H. ELLIS.	CHARLES E. WARD.
NATHANIEL I. BOWDITCH.	FRANK A. HOSMER.

¹ The president of the college is ex officio member and secretary of standing committees. The director of the experiment station is a member of the committee on experiment department, without vote.

*Committee on Course of Study and Faculty.*WILLIAM WHEELER, *Chairman.*

WILLIAM H. BOWKER.

M. FAYETTE DICKINSON.

DAVID SNEDDEN.

ELMER D. HOWE.

DAVIS R. DEWEY.

FRANK A. HOSMER.

*Committee on Farm.*GEORGE H. ELLIS, *Chairman.*

FRANK GERRETT.

CHARLES A. GLEASON.

NATHANIEL I. BOWDITCH.

*Committee on Horticulture.*J. LEWIS ELLSWORTH, *Chairman.*

DAVIS R. DEWEY.

ELMER D. HOWE.

HAROLD L. FROST.

*Committee on Experiment Department.*CHARLES H. PRESTON, *Chairman.*

J. LEWIS ELLSWORTH.

ARTHUR G. POLLARD.

CHARLES E. WARD.

HAROLD L. FROST.

*Committee on Buildings and Arrangement of Grounds.*M. FAYETTE DICKINSON, *Chairman.*

WILLIAM WHEELER.

FRANK GERRETT.

WILLIAM H. BOWKER.

CHARLES H. PRESTON.

Examining Committee of Overseers.

JOHN BURSLEY of West Barnstable.

ISAAC DAMON of Wayland.

N. B. TURNER of Great Barrington.

FRANK P. NEWKIRK of Easthampton.

WILLIAM E. PATRICK of Warren.

OFFICERS OF THE INSTITUTION.

THE FACULTY.

[The names of the faculty are arranged in groups according to rank. Within these groups the order depends upon seniority of service in the college, not upon seniority of appointment to the position now held.]

- KENYON L. BUTTERFIELD, A.M., LL.D., ... President's House.
President of the College and Professor of Rural Sociology.
- GEORGE F. MILLS,¹ M.A., ... 46 Amity Street.
Dean of the College, Head of the Division of the Humanities and
Professor of Languages and Literature.
- CHARLES H. FERNALD, Ph.D., ... 3 Hallock Street.
Honorary Director of the Graduate School.
- WILLIAM P. BROOKS, Ph.D., ... 28 Northampton Road.
Director of the Experiment Station and Lecturer on Soil Fertility.
- WILLIAM D. HURD, M.Agr., ... 82 Pleasant Street.
Director of Extension Work.
- FRANK A. WAUGH, M.Sc., ... Massachusetts Agricultural College.
Head of the Division of Horticulture and Professor of Landscape
Gardening.
- JAMES A. FOORD, M.Sc., ... Nutting Avenue.
Head of the Division of Agriculture and Professor of Farm Adminis-
tration.
- CHARLES WELLINGTON, Ph.D., ... 34 Amity Street.
Professor of General and Agricultural Chemistry.
- JAMES B. PAIGE, B.Sc., D.V.S., ... 42 Lincoln Avenue.
Professor of Veterinary Science, and Acting Dean.
- GEORGE E. STONE, Ph.D., ... Mount Pleasant.
Professor of Botany.
- JOHN E. OSTRANDER, A.M., C.E., ... 33 North Prospect Street.
Professor of Mathematics and Civil Engineering.
- HENRY T. FERNALD, Ph.D., ... 44 Amity Street.
Acting Director of the Graduate School and Professor of Entomology.
- GEORGE C. MARTIN, C.E., Captain, 18th U. S. Infantry,
35 North Prospect Street.
Professor of Military Science and Tactics.
- EDWARD A. WHITE, B.Sc., ... Mount Pleasant.
Professor of Floriculture.
- WILLIAM R. HART, A.M., ... 97 Pleasant Street.
Professor of Agricultural Education.
- FRED C. SEARS, M.Sc., ... Mount Pleasant.
Professor of Pomology.

¹ Absent on leave.

FRED C. KENNEY, ...	Mount Pleasant.
Treasurer of the College.	
PHILIP B. HASBROUCK, B.Sc., ...	130 Pleasant Street.
Registrar of the College, Associate Professor of Mathematics and Adjunct Professor of Physics.	
ROBERT WILSON NEAL, A.M., ...	7 Woodside Avenue.
Associate Professor of English.	
JOSEPH S. CHAMBERLAIN, Ph.D., ...	16 North Prospect Street.
Associate Professor of Chemistry.	
WILLIAM P. B. LOCKWOOD, B.Sc.Agr., ...	5 East Pleasant Street.
Associate Professor of Dairying.	
FRANK F. MOON, B.A., M.F., ...	6 Allen Street.
Associate Professor of Forestry.	
JOHN ALLEN MCLEAN, ¹ B.A., B.S., A., ...	— — — — —
Associate Professor of Animal Husbandry.	
GUY CHESTER CRAMPTON, ² Ph.D., ...	— — — — —
Associate Professor of Entomology.	
S. FRANCIS HOWARD, M.Sc., ...	10 Allen Street.
Assistant Professor of Chemistry.	
A. VINCENT OSMUN, M.Sc., ...	North Amherst, Mass.
Assistant Professor of Botany.	
SIDNEY B. HASKELL, B.Sc., ...	5 Fearing Street.
Assistant Professor of Agronomy.	
CLARENCE E. GORDON, A.M., ...	North Amherst, Mass.
Assistant Professor of Zoölogy and Geology.	
PERCY L. REYNOLDS, M.D., ...	17 Fearing Street.
Assistant Professor of Physical Education and Hygiene.	
FLOYD B. JENKS, B.Sc.Agr., ...	North Adams, Mass.
Assistant Professor of Agricultural Education.	
ALEXANDER E. CANCE, Ph.D., ...	9 Fearing Street.
Assistant Professor of Agricultural Economics.	
FREDERICK B. MCKAY, A.B., ...	12 Cottage Street.
Assistant Professor of English and Public Speaking.	
ELMER K. EYERLY, A.M., ...	North Amherst, Mass.
Assistant Professor of Political Science and Lecturer in Rural Sociology.	
BURTON N. GATES, Ph.D., ...	42 Lincoln Avenue.
Assistant Professor of Beekeeping.	
GEORGE N. HOLCOMB, A.B., S.T.B., ...	South Amherst, Mass.
Lecturer in History.	
FRANK W. RANE, ...	Boston, Mass.
Lecturer in Forestry.	
RAY L. GRIBBEN, ³ B.Sc.Agr., ...	66 Pleasant Street.
Instructor in Animal Husbandry.	
EDGAR L. ASHLEY, A.M., ...	Prospect House.
Instructor in German.	
ANDERSON A. MACKIMMIE, A.B., ...	Nutting Avenue.
Instructor in French and Spanish, Assistant to the Dean.	
C. ROBERT DUNCAN, B.Sc., ...	46 Pleasant Street.
Instructor in Mathematics and Physics.	

¹ Beginning with second semester.² Beginning April 1, 1911.³ Resigned Jan. 20, 1911.

CHARLES R. GREEN, B.Agr.,		Mount Pleasant.
Librarian.		
CHARLES S. HELLER,		1 Allen Street.
Instructor in Market Gardening.		
ALVAH J. NORMAN, B.Sc.,		Phillips Street.
Instructor in Pomology.		
CHARLES J. ROBINSON, B.Sc.,		Lincoln Block.
Instructor in Dairying and Animal Husbandry.		
JOHN NOYES, B.Sc.,		Wilder Hall.
Assistant in Landscape Gardening.		
W. A. TURNER, Ph.B.,		34 Amity Street.
Assistant in Chemistry.		
ALFRED LARSEN, B.Sc.,		— — —
Assistant in Bacteriology.		
MARCUS T. SMULYOU,		— — —
Graduate Assistant in Botany.		
Miss HELENA GOESSMANN,		Amity Street.
Assistant in English.		

GRADUATE ASSISTANTS.

JOHN N. SUMMERS, B.Sc.,		66 Pleasant Street.
Assistant in Entomology.		
LEONARD S. McLAINE, B.Sc.,		84 Pleasant Street.
Assistant in Zoölogy.		

OTHER COLLEGE OFFICERS.

EDWIN H. FORRISTALL, M.Sc.,		Massachusetts Agricultural College.
Farm Superintendent.		
RALPH J. WATTS, B.Sc.,		9 Fearing Street.
Secretary to the President.		
CHARLES H. WHITE, B.Sc.,		North Amherst, Mass.
Field Agent.		
NEWTON WALLACE,		6 Phillips Street.
Electrician.		
CLARENCE A. JEWETT,		112 Pleasant Street.
Superintendent of Buildings.		
JAMES WHITING,		Hallock Street.
Foreman, Department of Floriculture.		
WILLIAM CHESLEY,		Draper Hall.
Steward, Dining Hall.		
Miss MARY E. CALDWELL,		Draper Hall.
Bookkeeper.		
Miss CLARA L. STUART, ¹		— — —
Correspondence Clerk.		
Miss HENRIETTA WEBSTER,		Draper Hall.
Clerk, Treasurer's Office.		
Miss GERTRUDE E. WARNER, ²		— — —
Stenographer, Division of Agriculture.		
Miss RUTH G. SMITH,		North Amherst, Mass.
Clerk to the Dean and Registrar.		

¹ Absent after Feb. 1, 1911.² Resigned December, 1910.

Miss HELEN GRANGER, ...	Draper Hall.
Stenographer, Division of Horticulture.	
Miss DOROTHY MUDGE, ...	North Amherst, Mass.
Clerk, Treasurer's Office.	
Miss MABEL R. CASE, ...	Draper Hall.
Clerk, Division of Short Courses and Extension Work.	
Miss STELLA H. WEBB, ...	Draper Hall.
Correspondence Clerk, President's Office.	
Miss LILLIAN M. GELINAS, ...	Draper Hall.
Clerk, President's Office.	
Miss ALICE GILBERT, ...	Draper Hall.
Stenographer, Division of Agriculture.	

ADDITIONAL INSTRUCTORS FOR THE WINTER SCHOOL, 1911.

F. E. VAN HOEN, Instructor in Butter Making.

J. W. WELLMAN, Instructor in the Use of Separators.

OFFICERS OF SHORT COURSE AND EXTENSION WORK.

WILLIAM D. HURD, M.Agr., ...	82 Pleasant Street.
Director.	
CHARLES H. WHITE, B.Sc., ...	North Amherst, Mass.
Field Agent.	
ALVAH J. NORMAN, B.Sc., ...	Phillips Street.
Horticulture.	
CHARLES J. ROBINSON, B.Sc., ...	Lincoln Block.
Dairying and Animal Husbandry.	
Miss MABEL R. CASE, ...	Draper Hall.
Clerk to the Director of Short Courses.	

OFFICERS OF THE EXPERIMENT STATION.

WILLIAM P. BROOKS, Ph.D., ...	28 Northampton Road.
Director.	
JOSEPH B. LINDSEY, Ph.D., ...	47 Lincoln Avenue.
Vice-Director.	
FRED C. KENNEY, ...	Mount Pleasant.
Treasurer.	
CHARLES R. GREEN, B.Agr., ...	Mount Pleasant.
Librarian.	

DEPARTMENT OF PLANT AND ANIMAL CHEMISTRY.

JOSEPH B. LINDSEY, Ph.D., ...	47 Lincoln Avenue.
Chemist.	
EDWARD B. HOLLAND, M.Sc., ...	28 North Prospect Street.
Associate Chemist, in charge of Research Division.	
FRED W. MORSE, Ph.D., ...	44 Pleasant Street.
Research Chemist.	
HENRI D. HASKINS, B.Sc., ...	87 Pleasant Street.
In charge of Fertilizer Division.	
PHILIP H. SMITH, B.Sc., ...	102 Main Street.
In charge of Feed and Dairy Division.	
LEWELL S. WALKER, B.Sc., ...	19 Phillips Street.
Assistant.	
JAMES C. REED, B.Sc., ...	Nutting Avenue.
Assistant.	
JOSEPH F. MERRILL, B.Sc., ...	North Prospect Street.
Assistant.	
CLEMENT L. PERKINS, B.Sc., ...	32 North Prospect Street.
Assistant.	
JOSEPH P. HOWARD, ...	North Amherst, Mass.
Collector.	
HARRY J. ALLEN, ...	Amherst, Mass.
Assistant.	
JAMES R. ALCOCK, ...	North Amherst, Mass.
Assistant in Animal Nutrition.	

DEPARTMENT OF AGRICULTURE.

WILLIAM P. BROOKS, Ph.D., ...	Massachusetts Agricultural College.
Agriculturist.	
H. J. FRANKLIN, Ph.D., ...	Wareham, Mass.
In charge of Cranberry Investigation.	

ERWIN S. FULTON, B.Sc., ... North Amherst, Mass.
 First Assistant Agriculturist.
 EDWIN F. GASKILL, B.Sc., ... North Amherst, Mass.
 Second Assistant Agriculturist.

DEPARTMENT OF HORTICULTURE.

FRANK A. WAUGH, M.Sc., ... Massachusetts Agricultural College.
 Horticulturist.
 FRED C. SEARS, M.Sc., ... Mount Pleasant.
 Pomologist.
 JACOB K. SHAW, M.Sc., ... 1 Allen Street.
 Assistant Horticulturist.
 DAVID W. ANDERSON, B.Sc., ... 32 North Prospect Street.
 Graduate Assistant.

DEPARTMENT OF BOTANY AND VEGETABLE PATHOLOGY.

GEORGE E. STONE, Ph.D., ... Mount Pleasant.
 Botanist and Vegetable Pathologist.
 GEORGE H. CHAPMAN, M.Sc., ... 13 Fearing Street.
 Assistant Botanist.
 SUMNER C. BROOKS, B.Sc., ... 28 Northampton Road.
 Assistant Botanist.

DEPARTMENT OF ENTOMOLOGY.

HENRY T. FERNALD, Ph.D., ... 44 Amity Street.
 Entomologist.
 BURTON N. GATES, Ph.D., ... 42 Lincoln Avenue.
 Apiarist.
 ARTHUR I. BOURNE, B.A., ... 66 North Pleasant Street.
 Assistant in Entomology.

DEPARTMENT OF VETERINARY SCIENCE.

JAMES B. PAIGE, B.Sc., D.V.S., ... 42 Lincoln Avenue.
 Veterinarian.

DEPARTMENT OF METEOROLOGY.

JOHN E. OSTRANDER, A.M., C.E., ... 35 North Prospect Street.
 Meteorologist.
 CHARLES M. DAMON, ... Massachusetts Agricultural College.
 Observer.

OTHER OFFICERS OF THE EXPERIMENT STATION.

Miss ROSE J. BROWN, ... Draper Hall.
 Secretary to the Director.
 Miss JESSIE V. CROCKER, ... Sunderland, Mass.
 Stenographer, Department of Botany and Vegetable Pathology.

- Miss HARRIET COBB, ... 35 North Pleasant Street.
Stenographer, Department of Plant and Animal Chemistry.
- Miss BRIDIE O'DONNELL, ... Hadley, Mass.
Stenographer, Department of Entomology.
- Miss ALICE M. HOWARD, ... North Amherst, Mass.
Stenographer, Department of Plant and Animal Chemistry.

COMMITTEES OF THE FACULTY.¹

1910-11.

SCHOLARSHIP.

The DEAN.

Professor HASBROUCK.

Professor WHITE.

Assistant Professor GORDON.

Mr. MACKIMMIE.

SCHEDULE.

Professor OSTRANDER.

Associate Professor LOCKWOOD.

Associate Professor NEAL.

STUDENT ACTIVITIES.

Professor HURD.

Captain MARTIN.

Associate Professor LOCKWOOD.

Assistant Professor EYERLY.

Assistant Professor MCKAY.

LIBRARY.

Professor STONE.

Professor BROOKS.

Professor WELLINGTON.

Assistant Professor CANCE.

GRADUATE SCHOOL.

Professor FERNALD.

Professor WELLINGTON.

Professor PAIGE.

Professor STONE.

Professor SEARS.

Assistant Professor GORDON.

¹ The President of the college is ex officio member of these standing committees.

COMMITTEE ON EMPLOYMENT.

Professor SEARS.

Mr. KENNEY.

Assistant Professor HASKELL.

ENTRANCE EXAMINATIONS AND ADMISSION.

The REGISTRAR.

Assistant Professor HOWARD.

Assistant Professor OSMUN.

Assistant Professor MCKAY.

Mr. ASHLEY.

ATHLETICS.

Professor PAIGE.

Assistant Professor REYNOLDS.

Assistant Professor GORDON.

COURSE OF STUDY.

Professor HART.

Professor WAUGH.

Professor FOORD.

Professor OSTRANDER.

Associate Professor CHAMBERLAIN.

CATALOGUE AND OTHER PUBLICATIONS.

Associate Professor NEAL.

Assistant Professor EVERLY.

Assistant Professor CANCE.

UNCLASSIFIED STUDENTS.

Professor WHITE.

Associate Professor CHAMBERLAIN.

Associate Professor LOCKWOOD.

COMMENCEMENT.

Professor PAIGE.

Professor WELLINGTON.

Professor WHITE.

Captain MARTIN.

Mr. KENNEY.

Assistant Professor HOWARD.

ADVISORY COMMITTEE ON DISCIPLINE.

The DEAN.

The TREASURER.

The REGISTRAR.

The COMMANDANT.

THE COLLEGE.

ADMISSION.

A. APPLICATION FOR ADMISSION.

Correspondence about admission should be addressed to the registrar.

Every applicant for admission to the college must be at least sixteen years old, and must present to the registrar proper testimonials of good character. Such testimonials, whenever possible, should come from the principal of the school at which the applicant has prepared for college. Candidates who desire to present themselves for examination in any subjects must make application to the college for such privilege on or before June 1 of the year in which examination is desired. Blanks for such application may be obtained by addressing the registrar of the college. If an applicant desires a free State scholarship, he must also present to the registrar a certificate of appointment from the State Senator of his district. Blanks for this purpose also may be obtained of the registrar. All entrance credentials must be in the hands of the registrar before the applicant can matriculate.

B. MODES OF ADMISSION.

Students are admitted to the freshman class either upon *certificate* or upon *examination*. No *diploma* from a secondary school will be considered.

CERTIFICATES. — The entrance requirements may be met by certification in any of the following ways: —

1. By presenting certificate from a school approved for such privilege by this college.
2. By presenting certificate from any school approved by the college entrance examination boards.
3. By presenting the customary credentials from the Board of Regents of the State of New York for any of the subjects of the entrance requirements.

Certificates must present at least three of the six required subjects for admission, and not less than seven of the necessary fourteen credits in all. Those subjects lacking on certificate (except for

the permitted number of conditions) must be made up at the time of the examinations for admission.

Blank forms for certification — sent to principals or school superintendents only — may be obtained on application to the registrar of the college.

EXAMINATIONS. — The examination in each subject may be oral or written, or both. The standard required for passing an examination for admission is 65 per cent. Conditions to the amount of two units will be allowed.¹

Places of Examination. — Examinations for admission to the college are held as follows: —

In June of each year: in Amherst, in the building of the Department of Mathematics, Massachusetts Agricultural College; in Boston, in the College of Liberal Arts of Boston University, Boylston Street, corner of Exeter; in Worcester, in Horticultural Hall.

Schedule for Entrance Examinations, June 21–24, 1911. — The examinations in June will follow this schedule: —

First Day.

- 1 P.M. Registration.²
- 1.15–5 P.M. Latin (A and B).

Second Day.

- 8 A.M. Plane geometry.
- 10 A.M. Chemistry.
- 11.30 A.M. United States history and civics.
- 2 P.M. Algebra.
- 3.30 P.M. Physics.
- 4.30 P.M. Elective English.

¹ *Entrance with Condition in English.* — Under the rule permitting entrance conditions of not more than two units of the preparatory subjects, applicants may be admitted, upon examination, with a condition in English under these restrictions: (1) The parts of the preparatory study in English will be valued by the examiners approximately as follows in entrance units: (a) composition, etc., one and one-quarter units; (b) reading and study (including interpretation, three-quarters of a unit; see p. 28), one and three-quarters units; total, 3 units. (2) The applicant to show, upon examination, satisfactory preparation in work amounting to not less than two units.

The purpose of this provision is to avoid the possible injustice of excluding, without further trial, applicants who appear to be deficient in preparation in only one subject; and the examination will be so set as to permit the estimating of separate credits to carry out this purpose.

Attention is called to the standing rule of the uniform entrance requirement bodies concerning English as an admission subject; namely, that applicants whose work is seriously lacking in correct spelling, punctuation, grammar or other elementary essentials of good usage will be rejected.

Students so admitted, must, to remove the condition, pass an examination covering the regular 3-units requirement.

² Candidates who have no examination at the time set for registration may register at the time of their first examination should they so desire.

Third Day.

- 8 A.M. Required English.
 11 A.M. Solid geometry, agriculture.
 2 P.M. History, required and elective.
 5 P.M. Botany.

Fourth Day.

- 8 A.M. French, German, required and elective.
 1 P.M. Greek, and all one-half credit electives, except those already noted.

Schedule for Entrance Examinations in September.—In September, 1911, the examinations will be given September 11 to 14, inclusive, and will follow the order indicated for June, beginning September 11 at 1 P.M.

C. REQUIREMENTS FOR ADMISSION.

The requirements for admission are based on the completion of a four-years course in a high school or its equivalent, and are stated in terms of units. The term unit means the equivalent of five recitations a week for a school year. Neither more nor less credit will be given in any subject than is indicated in the table below. Fourteen units must be offered for admission, of which nine are required and five are elective.

(a) The following nine units are required:—

Language.

English, ...	3
French or German, ...	2

History and Civics.

United States history and civics, ...	$\frac{1}{2}$
History (elective), ...	1

- (a) Ancient history.
 (b) Medieval and modern history.
 (c) English history.
 (d) General history.

Mathematics.

Algebra, through progressions, ...	$1\frac{1}{2}$
Plane geometry, ...	1

(b) In addition to the requirements under (a), five units must be offered from the following-named elective subjects. Not more than four of those subjects in which the credit sought is one-half unit will be accepted.

Language.

English in addition to requirements, ...	1
French in addition to requirements, ...	2 or 1 ¹
German in addition to requirements, ...	2 or 1 ¹
Greek, ...	2 or 3
Latin, ...	2 or 3
Latin A, including Cæsar and Cicero, 2; Latin	
B, including Virgil and Prose Composition, 1.	

History.

In addition to requirements, ...	1 or 2
--	--------

Mathematics, and Other Sciences.

Solid geometry, ...	$\frac{1}{2}$
Trigonometry, ...	$\frac{1}{2}$
Chemistry, ...	1
Physiography, ...	$\frac{1}{2}$
Physiology, ...	$\frac{1}{2}$
Agriculture, ²	$\frac{1}{2}$ or 1
Botany, ²	$\frac{1}{2}$ or 1
Geology, ²	$\frac{1}{2}$
Physics, ²	1
Zoölogy, ²	$\frac{1}{2}$
Commercial geography, ³	$\frac{1}{2}$
Drawing, ³	$\frac{1}{2}$
Manual training, ³	$\frac{1}{2}$ or 1

PRESENTATION OF NOTE-BOOKS.—The keeping of a note-book is required as part of the preparation in those subjects indicated (see note 1).

Candidates presenting themselves for examination in such subjects must present at the same time the required note-book, properly certified by the principal. Candidates presenting such subjects on certificate should not present note-books; but their certificate must state that note-books have been satisfactorily completed.

D. STATEMENT⁴ OF PREPARATION REQUIRED FOR ADMISSION.

In some cases the requirements of the College Entrance Examination Board are here mentioned. A pamphlet containing detailed explanation of these requirements can be had of the Board for 10 cents. Address sub-station 84, New York City.

AGRICULTURE.—Owing to the wide divergence of the methods of teaching agriculture in the public schools, the student will be required to bring a statement from the principal of the amount and

¹ If but one elective unit be offered, it must be in the same language as that offered to meet the two-year language requirement.

² Note-book required as part of preparation will be credited as part of the examination.

³ Certification necessary in these subjects; no examinations given.

⁴ In alphabetical order by subjects.

kinds of work accomplished and of the text-books used. The examination will be based somewhat upon this information; but it will call for not less than one-half year of creditable work of high school grade.

BOTANY. — For one unit of credit in botany, the work outlined in the statement of requirements issued by the College Entrance Examination Board, or its equivalent, will be accepted. This work should occupy one school year and include laboratory and supplementary text-book study. For one-half unit of credit, work that covers the same ground but occupies half the time required for a full unit of credit will be accepted. These requirements are met by such texts as Stevens's "Introduction to Botany" and Bergen and Davis's "Principles of Botany." A note-book containing neat, accurate drawings and descriptive records forms part of the requirement for either the half-unit or the one-unit credit; and this note-book must be presented by all applicants for admission upon examination in this subject. The careful preparation of an herbarium is recommended to all prospective students of this college, although the herbarium is not required.

CHEMISTRY. — The entrance examination in chemistry will cover the work outlined by the College Entrance Examination Board as preparatory for college entrance. In general, this consists of a year of high school chemistry from such text-books as Newell's "Descriptive Chemistry" or Remsen's "Elements of Chemistry," with laboratory work on the general properties of the common elements, some of the experiments being quantitative. The keeping of a note-book is required.

COMMERCIAL GEOGRAPHY. — Preparation should be given in a course equivalent to that laid down in Adams's "Commercial Geography," Trotter's "Geography of Commerce," or a similar work.

DRAWING. — Applicants may offer either freehand or mechanical drawing, or both. They must be able to make an accurate freehand sketch, in either outline or light and shade, of the appearance of a group of geometric solids, and have a sufficient knowledge of perspective to enable them to draw correctly a simple geometric model from memory; or, if they present mechanical drawing, they must have considerable working familiarity with drawing instruments, and be able to make an accurate inked working drawing, in orthographic projection, of some simple object. Emphasis is laid on facility in doing good freehand lettering. For a limitation of the work that may be presented see "Manual Training."

ENGLISH. — Preparation in English should develop in the candi-

date (1) ability to express himself well and correctly in his mother tongue, and (2) ability to penetrate through language to the meaning that underlies it.

All candidates for admission — whether by examination or by certification — are urged to secure a thorough training in composition, in which at least part of the subjects written on shall be derived from personal observation, experience and thought. They are urged to cultivate especially, in all their writing, the habit of correctness in spelling, grammar, punctuation, sentence structure and paragraph building. This habit will be of much greater help to them in their work in the college than will mere knowledge of the prescribed books.

In the examination, direct questions may be put, including questions upon grammar. Several compositions, each about one hundred and fifty words long, will be required, including papers to test the candidate's ability to think and write clearly, either on matters involving personal experience or on topics involving knowledge of the books. All candidates received as members of the freshman class are expected to be able — as a result of their study of the books prescribed "For Study and Practice" — to paraphrase or interpret, with some insight, unfamiliar verse or prose of medium difficulty, in which the meaning does not depend on anything outside the passage itself; and, as part of every examination, at least one passage is given for such interpretation.

The list of books for 1911-12 is made up from the list recommended by the Conference on Uniform Entrance Requirements in English. The examination will be based upon these; but an applicant who has prepared upon other books of the longer list will be examined thereon if he notify the Department of English of his wish before the first day of June preceding the examinations.

For 1911: —

(a) For reading and composition practice: Shakspeare's "Merchant of Venice" and "Julius Cæsar;" the "Sir Roger de Coverley Papers" in "The Spectator;" Franklin's "Autobiography;" Scott's "Ivanhoe;" Hawthorne's "House of the Seven Gables;" Dickens's "A Tale of Two Cities;" Scott's "The Lady of the Lake;" Macaulay's "Lays of Ancient Rome;" Tennyson's "Gareth and Lynette," "Lancelot and Elaine" and "The Passing of Arthur."

(b) For detailed study and practice: Shakspeare's "Macbeth;" Milton's "Lycidas," "Comus," "L'Allegro" and "Il Penseroso;" Burke's "Speech on Conciliation with America," or Washington's

“Farewell Address” and Webster’s “First Bunker Hill Oration;” Macaulay’s “Life of Johnson” or Carlyle’s “Essay on Burns.”

For 1912:—

(a) For reading and composition practice: Shakspeare’s “As You Like It” and “Julius Cæsar;” Franklin’s “Autobiography;” Goldsmith’s “The Deserted Village;” Dickens’s “A Tale of Two Cities;” George Eliot’s “Silas Marner;” Irving’s “Sketch Book;” Scott’s “The Lady of the Lake;” Byron’s “Mazeppa” and “The Prisoner of Chillon;” and Macaulay’s “Lays of Ancient Rome.”

(b) For thorough study and practice: Shakspeare’s “Macbeth;” Milton’s “Comus,” “L’Allegro” and “Il Penseroso,” or Tennyson’s “Gareth and Lynette,” “Lancelot and Elaine” and “The Passing of Arthur;” Burke’s “Speech on Conciliation with America,” or Washington’s “Farewell Address” and Webster’s “First Bunker Hill Oration;” Macaulay’s “Life of Johnson,” or Carlyle’s “Essay on Burns.”

For 1913, 1914, 1915:—

English Grammar and Composition.—Command of correct and clear English (spoken or written) requires instruction in grammar and composition. English grammar should ordinarily be reviewed in the secondary school; and correct spelling and grammatical accuracy should be rigorously exacted in connection with all written work during the four years. The principles of English composition governing punctuation, the use of words, paragraphs, and the different kinds of whole composition, including letter writing, should be thoroughly mastered; and practice in composition, oral as well as written, should extend throughout the secondary school period. Written exercises may well comprise narration, description and easy exposition and argument based upon simple outlines. It is advisable that subjects for this work be taken from the student’s personal experience, general knowledge and studies other than English, as well as from his reading in literature. Finally, special instruction in language and composition should be accompanied by concerted effort of teachers in all branches to cultivate in the student the habit of using good English in his recitations and various exercises, whether oral or written.

Literature.—Ability to read with accuracy, intelligence and appreciation is sought through study of books included in two lists, headed respectively “Reading” and “Study,” from which may be framed a progressive course in literature covering four years. In connection with both lists the student should be trained in reading aloud, and encouraged to commit to memory some of the more

notable passages, both in verse and in prose. As an aid to literary appreciation, he is further advised to acquaint himself with the most important facts in the lives of the authors whose works he reads, and with their place in literary history.

(a) Reading: The aim of this course is to foster in the student the habit of intelligent reading, and to develop a taste for good literature by giving him a first-hand knowledge of some of its best specimens. He should read the books carefully, but his attention should not be so fixed upon details that he fails to appreciate the main purpose and charm of what he reads.

With a view to large freedom of choice, the books provided for reading are arranged in the following groups, from which at least ten units (each unit being set off by semicolons) are to be selected, two from each group:—

I. The “Old Testament,” comprising at least the chief narrative episodes in Genesis, Exodus, Joshua, Judges, Samuel, Kings and Daniel, together with the books of Ruth and Esther; the “Odyssey,” with the omission, if desired, of books I., II., III., IV., V., XV., XVI., XVII.; the “Iliad,” with the omission, if desired, of books XI., XIII., XIV., XV., XVII., XXI.; Virgil’s “Æneid.” The “Odyssey,” “Iliad” and “Æneid” should be read in English translations of recognized literary excellence.

For any unit of this group a unit from any other group may be substituted.

II. Shakspeare’s “Merchant of Venice;” “Midsummer Night’s Dream;” “As You Like It;” “Twelfth Night;” “Henry the Fifth;” “Julius Cæsar.”

III. Defoe’s “Robinson Crusoe,” Part I.; Goldsmith’s “Vicar of Wakefield;” either Scott’s “Ivanhoe” or “Quentin Durward;” Hawthorne’s “House of the Seven Gables;” either Dickens’s “David Copperfield” or “A Tale of Two Cities;” Thackeray’s “Henry Esmond;” Mrs. Gaskell’s “Cranford;” George Eliot’s “Silas Marner;” Stevenson’s “Treasure Island.”

IV. Bunyan’s “Pilgrim’s Progress,” Part I.; “The Sir Roger de Coverley Papers” in “The Spectator;” Franklin’s “Autobiography” (condensed); Irving’s “Sketch Book,” Macaulay’s “Essays on Lord Clive” and “Warren Hastings;” Thackeray’s “English Humourists;” selections from Lincoln, including at least the two inaugurals, the speeches in Independence Hall and at Gettysburg, the last public address and the letter to Horace Greeley, along with a brief memoir or estimate; Parkman’s “Oregon Trail;” either Thoreau’s “Walden,” or Huxley’s “Autobiography” and selections

from "Lay Sermons," including the addresses on "Improving Natural Knowledge;" "A Liberal Education" and "A Piece of Chalk;" Stevenson's "Inland Voyage" and "Travels with a Donkey."

V. Palgrave's "Golden Treasury" (first series), books II. and III., with especial attention to Dryden, Collins, Gray, Cowper and Burns; Gray's "Elegy in a Country Churchyard" and Goldsmith's "Deserted Village;" Coleridge's "Ancient Mariner" and Lowell's "Vision of Sir Launfal;" Scott's "Lady of the Lake;" Byron's "Childe Harold," Canto IV., and "Prisoner of Chillon;" Palgrave's "Golden Treasury" (first series), book IV., with especial attention to Wordsworth, Keats and Shelley; Poe's "Raven," Longfellow's "Courtship of Miles Standish," and Whittier's "Snow Bound;" Macaulay's "Lays of Ancient Rome" and Arnold's "Sohrab and Rustum;" Tennyson's "Gareth and Lynette," "Lancelot and Elaine" and "The Passing of Arthur;" Browning's "Cavalier Tunes," "The Lost Leader," "How They Brought the Good News from Ghent to Aix," "Home Thoughts from Abroad," "Home Thoughts from the Sea," "Incident of the French Camp," "Hervé Riel," "Pheidippides," "My Last Duchess," "Up at a Villa—Down in the City."

(b) Study: This part of the requirement is intended as a natural and logical continuation of the student's earlier reading, with greater stress laid upon form and style, the exact meaning of words and phrases, and the understanding of allusions. For this close reading are provided a play, a group of poems, an oration and an essay, as follows:—

Shakspere's "Macbeth;" Milton's "L'Allegro," "Il Penseroso" and "Comus;" either Burke's "Speech on Conciliation with America," or both Washington's "Farewell Address" and Webster's "First Bunker Hill Oration;" either Macaulay's "Life of Johnson," or Carlyle's "Essay on Burns."

*Examination.*¹—However accurate in subject-matter, no paper will be deemed satisfactory if seriously defective in punctuation, spelling or other essentials of good usage.

The examination will be divided into two parts, one of which may be taken as a preliminary, and the other as a final.

The first part of the examination will be based upon ten units chosen, in accordance with the plan described earlier, from the lists headed reading; and it may include also questions upon grammar

¹ Read in connection with this statement the first three paragraphs under "English," pp. 27, 28.

and the simpler principles of rhetoric, and short compositions upon topics drawn from the student's general knowledge or experience. On the books prescribed for reading, the form of the examination will usually be the writing of short paragraphs on several topics which the candidate may choose out of a considerable number. These topics will involve such knowledge and appreciation of plot, character-development and other qualities of style and treatment as may be fairly expected of boys and girls. In grammar and rhetoric, the candidate may be asked specific questions upon the practical essentials of these studies, such as the relation of the various parts of a sentence to one another, the construction of individual words in a sentence of reasonable difficulty, and those good usages of modern English which one should know in distinction from current errors.

The second part of the examination will include composition and those books comprised in the list headed study. The test in composition will consist of one essay or more, developing a theme through several paragraphs; the subjects will be drawn from the books prescribed for study, from the candidate's other studies and from his personal knowledge and experiences quite apart from reading. For this purpose the examiner will provide several subjects, perhaps five or six, from which the candidate may make his own selections. The test on the books prescribed for study will consist of questions upon their content, form and structure, and upon the meaning of such words, phrases and allusions as may be necessary to an understanding of the works and an appreciation of their salient qualities of style. General questions may also be asked concerning the lives of the authors, their other works, and the periods of literary history to which they belong.

ENGLISH, ELECTIVE. — To secure a fourth entrance credit in English, the applicant should do (a) the equivalent of three years' work, five periods weekly (required English), and also (b) the equivalent of a fourth year's work, five periods weekly. Applicants not certified with a fourth entrance credit will be examined. In order, however, that examination questions may be prepared, the applicant for examination should notify the Department of English by the first of June preceding the examinations, stating which English subject or subjects he wishes to present.

Subjects accepted. — The applicant may offer (a) any one of the subjects stated hereunder, or (b) any two of these subjects in combination.

(a) History of American literature.

(b) History of English literature (or lives of the great authors).

(c) Classics other than those read to meet the three-credit requirement, the applicant to present a complete list of his readings. The reading for the fourth credit should be of the same detailed, careful kind as is given the books prescribed for "Reading and Practice" in the official list of entrance requirement readings.

(d) Advanced composition.

(e) History of the English language.

(f) Advanced high school grammar.

Advanced Standing in College.—Whether advanced standing shall be given applicants entering with a fourth credit in English will be determined by consideration of each case individually. Much weight is given to the ability of the student to express himself correctly and clearly, to think clearly, and to grasp the meaning of printed language. A special examination will be given in the opening week of college, notice of which will be posted on the English bulletin board.

Presentation of Note-books and Themes.—Applicants for examination, either for fourth-unit credit or for advanced standing, are advised to present the note-books, themes, etc., prepared by them in the preparatory school, as an aid toward determining their proficiency.

FRENCH.—The necessary preparation for this examination is stated in the description of the two-year course in elementary French recommended by the Modern Language Association, contained in the definition of requirements of the College Entrance Examination Board.

Third and fourth year French (elective subjects for admission).—For a single credit unit in French as an elective subject for entrance, when required units have been offered in French, the work described by the College Entrance Examination Board as "intermediate" is expected. For two credit units, the work described as "intermediate" and "advanced" is expected.¹

GEOLOGY.—Grouped with zoölogy, which see.

GERMAN.—The entrance requirements in German conform to those of the College Entrance Examination Board for elementary German (the standard two-year requirements).¹

Third and fourth year German (elective subjects for admission).—For a single credit unit in German as an elective subject for entrance, when required units have been offered in German, the

¹If the two required and two elective modern language units are offered in French and German, the work known as "Elementary" may be offered in both cases.

work described by the College Entrance Examination Board as "intermediate" is expected. For two credit units, the work described as "intermediate" and "advanced" is expected.

GREEK. — Greek will receive credit as an elective requirement upon either examination or certification, as follows: —

1. Two credit units will be allowed if satisfactory proficiency is shown (including grammar) in (a) the translation of a passage or passages taken from the first two books of Xenophon's "Anabasis;" and (b) the translation of passages of Attic prose at sight.

2. Three credit units will be allowed if, in addition to the above, satisfactory proficiency be shown in (a) the translation of a passage or passages selected from the first book of Homer's "Iliad," and (b) translation of passages of Homer's "Iliad" at sight, with questions on the forms and constructions of the passages.

HISTORY. — Of the one and one-half required units the one-half unit must be offered in United States history and civics, and the one required unit must be offered in either ancient history, medieval and modern history, English history or general history. Either one or two elective units in any one of the historical subjects here named may be offered, provided that such units may not be offered in the same subject in which the required unit has been offered.

Preparation in history will be satisfactory if made in accordance with the recommendations of the committee of seven of the American Historical Association, as outlined by the College Entrance Examination Board. The examination will require comparisons and the use of judgment by the candidate rather than the mere use of memory, and it will presuppose the use of good text-books, collateral reading and practice in written work. Geographical knowledge may be tested by requiring the location of places and movements on an outline map.

To indicate in a general way the character of the text-book work expected, the texts of the following authors are suggested: Botsford, Morey or Myers, in ancient history (to 814 A.D.); Adams, West or Myers, in medieval history; Montgomery, Larned or Cheyney, in English history; Myers or Fisher, in general history; Fiske, together with MacLaughlin or Montgomery, in United States history and civics.

LATIN. — Latin will receive credit as an elective requirement upon either examination or certification, as follows: —

1. Two credit units will be allowed if satisfactory proficiency is shown (including grammar) in (a) the translation of a passage or passages taken from Cæsar's "Gallic War," books I. to IV., or an

equivalent, and from Cicero's "Orations against Catiline;" and (b) the translation of passages of Latin prose at sight.

2. Three credit units will be allowed if, in addition to the above, satisfactory proficiency be shown in (a) the translation of a passage or passages selected from books I. and II. of Virgil's "Æneid;" and (b) the translation into Latin prose of a passage of connected English narrative based on some portion of Cæsar's "Gallic War," books I. to IV.

MANUAL TRAINING.—An entrance credit of one-half or one unit is allowed for manual training, on the presentation of a certificate from the principal of the school showing the scope and character of the applicant's work. The preparation may include mechanical drawing, working in wood, metals, leather, etc. When mechanical drawing is presented as a part of the work in manual training, no other credit for drawing will be allowed. No examination is given in this subject; applicants must present certificates to secure credit.

MATHEMATICS.—(a) *Required*.—Algebra: The four fundamental operations for rational algebraic expressions; factoring, determination of highest common factor and lowest common multiple by factoring; fractions, including complex fractions; ratio and proportion; linear equations, both numerical and literal, containing one or more unknown quantities; problems depending on linear equations; radicals, including the extraction of the square root of polynomials and numbers; exponents, including the fractional and negative; quadratic equations, both numerical and literal; simple cases of equations with one or more unknown quantities that can be solved by the methods of linear or quadratic equations; problems depending upon quadratic equations; the binomial theorem for positive integral exponents, the formulas for the n th term and the sum of the terms of arithmetic and geometric progressions, with applications.

Plane Geometry: The usual theorems and constructions of good text-books, including the general properties of plane rectilinear figures; the circle and the measurement of angles; similar polygons; areas; regular polygons and the measurement of the circle; the solution of numerous original exercises, including loci problems; applications to the mensuration of lines and plane surfaces.

(b) *Elective*.—Solid Geometry: The usual theorems and constructions of good text-books, including the relations of planes and lines in space; the properties and measurement of prisms, pyramids, cylinders and cones; the sphere and spherical triangle; the solution

of numerous original exercises, including loci problems; applications to the mensuration of surfaces and solids.

Plane Trigonometry: A knowledge of the definitions and relations of trigonometric functions and of circular measurements and angles; proofs of the principal formulas and the application of these formulas to the transformation of the trigonometric functions; solution of trigonometric equations, the theory and use of logarithms, and the solution of right and oblique triangles.

PHYSICS. — To satisfy the entrance requirement in physics, the equivalent of at least one unit of work is required. This work should consist of both class-room work and laboratory practice. The work covered in the class room should be equal to that outlined in Hall & Bergen's "Text-book of Physics;" the laboratory work should represent at least thirty-five experiments involving careful measurements, with accurate recording of each in laboratory note-book. This note-book, certified by the instructor in the subject, must be submitted by each candidate presenting himself for examination in physics; credit for passing the subject will be given on laboratory notes and on the examination paper submitted. Candidates entering on certificate will not be required to present note-books, but the principal's certification must cover laboratory as well as class-room work.

PHYSIOLOGY. — Hough & Sedgwick's "The Human Mechanism;" Martin's "The Human Body: Briefer Course."

ZOÖLOGY, PHYSIOGRAPHY, GEOLOGY. — The following suggestions are made concerning preparation for admission in the subjects named above:—

For physiography, Davis's "Elementary Physical Geography;" Gilbert & Brigham's "Introduction to Physical Geography." For zoölogy, text-books entitled "Animals" or "Animal Studies," by Jordan, Kellogg and Heath; Linville & Kelley's "A Text-book in General Zoölogy." For geology, A. P. Brigham's "A Text-book of Geology" or Tarr's "Elementary Geology."

Applicants for examination in zoölogy are *required* to present certified laboratory note-books; applicants for examination in the other subjects are *advised* to present a note-book, if laboratory work has been done. Good note-books may be given credit for entrance. Examination in these subjects will be general, in recognition of the different methods of conducting courses; but students will be examined on the basis of the most thorough secondary school courses.

E. ADMISSION TO ADVANCED STANDING.

Candidates for admission to advanced standing, in addition to meeting the regular entrance requirements, must also pass examinations in those subjects already pursued by the class they desire to enter. To meet this requirement, a student transferring to this college from another college or university of recognized standing must present the following credentials:—

1. A letter of honorable dismissal from the institution with which he has been connected.
2. A statement or certificate of his entrance record.
3. A statement from the proper officer showing a complete record of his work while in attendance.
4. A marked catalogue showing the courses pursued.

These credentials should be presented to the registrar. Applications will be judged wholly on their merits and the college may prescribe additional tests before accepting applicants or determining the standing to be granted them.

F. OTHER INFORMATION ABOUT ENTRANCE.

1. The privileges of the college may be withdrawn from any student at any time if such action is deemed advisable. (It is immaterial whether the pupil has entered by certificate or by examination.)

2. The examination in each subject may be either oral or written, or both. The standard required for passing an entrance examination is 65 per cent.

3. Candidates must receive credit for twelve units out of the total number required for entrance, and will be conditioned in those subjects not passed. No candidate deficient in both algebra and plane geometry will be admitted. For a special provision permitting entrance with a condition in English, see footnote, p. 24.

4. Examinations for the removal of entrance conditions will be held as follows: (1) First entrance condition examination, in the week following the Thanksgiving recess. (2) Second entrance condition examination, in the sixteenth week of the first semester.

5. Credits for entrance requirements, whether gained by certificate or by examination, will hold good for one year.

6. Examinations in part of the subjects required for entrance may be taken one year before entering college.

7. For information concerning expenses, scholarships, etc., see "General Information."

8. For information concerning admission to short courses see "Short Courses."

9. All requests for information concerning admission of unclassified students should be addressed to Prof. E. A. White, chairman of committee on unclassified students.

G. UNCLASSIFIED STUDENTS.

Students not candidates for a degree (unclassified students) are admitted under the following provisions:—

1. No entrance examination is required, but applicants must bring certificates showing that they have finished a four-years high school course or its equivalent, and furnish satisfactory testimonials as to moral character.

2. No applicant under twenty-one years of age will be admitted as an unclassified student.

3. Each unclassified student must take from the regular courses a minimum of twelve credit hours a week.

4. In order to be admitted to any course, an unclassified student must have had all prerequisite subjects for that course.

5. Every unclassified student must do all the work of the courses elected, and take all examinations therein. In order to pass such courses he must attain a grade of at least 75 per cent. An unclassified student who passes in less than two-thirds of his work will be dropped from college.

6. All unclassified students are subject to the supervision of a special committee.

7. Any unclassified student may be dropped from college at any time if his presence in any class is undesirable or his work is unsatisfactory; and no unclassified student will be allowed to remain in college more than four semesters without the special permission of the faculty.

8. Unclassified students are subject to the regulations applying to classified students.

COURSES OF INSTRUCTION.

A. TABLE OF UNDERGRADUATE SUBJECTS.

[The figures indicate the number of credit hours a week. For details, see the descriptions of courses.]

FRESHMAN YEAR.

First Semester.

[All work required.]

English, ...	4
French or German, ¹	4
Algebra, ...	5
Chemistry, ...	3
Hygiene, ...	1
Physical education, ²	2
Public speaking (at option of instructor), ...	1
College life (attendance required without credit).	

19 or 20

Second Semester.

[All work required.]

English, ...	4
French or German, ...	4
Geometry and trigonometry, ...	5
Chemistry, ...	3
Elementary agriculture, ...	2
Physical education, ...	2
Public speaking (if not taken in semester 1), ...	1

20 or 21

SOPHOMORE YEAR.

First Semester.

[All work required.]

English, ...	2
French or German, ...	3
Agronomy, ...	3
Zoölogy, ...	3
Physics, ...	5
Physical education, ...	2

18

¹ Students may continue in college the language that they present for admission, or they may take the other; but they must continue whichever language they so elect until the end of the first semester of the sophomore year. Eleven college credits are required in this language.

² Physical education includes military training.

Second Semester.

[All courses under "Required," with any two of those under "Elective."]

[Required.]	
English, ...	2
Elementary horticulture, ...	2
Botany, ...	4
Agricultural industry, ...	3
Physical education, ...	2
	13

[Elective.]	
French or German, }	
Animal husbandry, }	
Geology, . . . }	each 3 hours. Any two, . . . 6
Physics, . . . }	
Chemistry, . . }	
Surveying, . . }	
	19 or 18

JUNIOR AND SENIOR YEARS.

In the junior and in the senior year, work must be taken each semester amounting to not fewer than seventeen nor more than twenty credits.

[Required.]

The following-named subjects are required after the sophomore year, as indicated:—

Physical education, two credits each semester of junior year,	4
Political science (Course 1, Economics), ...	3
English (any of the elective courses except Literature 15 and 16), ...	3

[Elective.]

Unless otherwise stated, elective courses are open to both juniors and seniors. Elections are subject to such provisions as either the faculty or the instructors in the courses may declare. In electing courses, students will prepare the statement of their elections strictly in this form:—

For semester ^{one}_{two} of 1910–11, I elect these courses, namely:—

No. of Course in Catalogue.	Name of Course in Catalogue.

(Signed) _____

Class of 191—.

[Only those courses are here mentioned which are entirely elective; some courses that are open to election by part of the students but are required courses for others are omitted. For such courses, see under the respective department headings the descriptions of "Required Courses."]

Agricultural education, 1, 2, 3, 4, 5, 6.

Agriculture:—

Agriculture, 3.

Agronomy, 3, 4, 6, 8.

Animal husbandry, 2, 3, 4, 5, 6.

Dairying, 1, 2, 3, 4.

Farm administration, 3, 4.

Botany, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13, 14.

Chemistry, 3, 4, 5, 6, 7, 8, 9, 10, 13, 14, 15, 17, 18, 19.

Entomology, 2, 3, 4.

Horticulture:—

Horticulture, 3, 4, 6.

Pomology, 1, 2, 3, 4.

Floriculture, 1, 2, 3, 4.

Landscape gardening, 1, 2, 3, 4, 5, 6, 7, 8.

Forestry, 1, 2.

Market gardening, 2, 3.

Drawing, 1, 2.

Humanities:—

English:—

English language and journalism, 9, 10, 15, 16, 17.

Literature, 9, 10, 13, 14, 15, 16, 18.

Public speaking, 8, 9, 10.

Modern European languages:—

French, 6, 7, 8.

Spanish, 1, 2.

German, 6, 7, 8.

Music, 1, 2.

Political science, 2, 3, 4, 5, 6, 8.

Mathematics, 7, 10; Physics, 6, 9, 15; Engineering, 8, 11, 12, 13, 14.

Military science, 11, 12.

Physical education, 7, 8, 9, 10.

Rural social science:—

Agricultural economics, 4, 5, 6, 7, 9, 10.

Rural sociology, 12, 16.

Veterinary science, 1, 3, 4.

Zoölogy and geology:—

Zoölogy, 3, 4, 5, 6, 7, 8, 9.

Geology, 2.

B. UNDERGRADUATE COURSES.

[All courses given in the first semester bear odd numbers; all given in the second semester bear even numbers. Studies are pursued in courses, "course" implying the study given a subject within one semester, without regard to the total number of hours or to the number of credits. Under the heading "Required Courses" are classified all courses that are specifically required of any group of students, although in some cases the same courses are open to other students as electives. The special mention of certain courses as prerequisite to other courses does not imply that no courses but those so mentioned are "preliminary or preparatory" within the meaning of paragraph 9, page 9 of the Rules. Announcements of courses that are not given in 1910-11 are inclosed in brackets.]

Department of Agricultural Education.

Professor HART and Assistant Professor JENKS.

Elective Courses.

1. MEANING OF EDUCATION (PSYCHOLOGY). — A study of the development, structure and function of the nervous system with reference to the sense organs; relation of mind to the nervous system; growth and nature of mental processes; the activities of the mind in the process of learning. Text-book, lectures, discussion, and collateral readings and reports; 3 hours. Credit, 3.

Professor HART.

2. VOCATIONAL EDUCATION (HISTORY AND PHILOSOPHY). — A survey of educational, religious and social movements with reference to their vocational aspects; the growth of educational institutions as influenced by science and industry. Lectures, collateral readings, reports, and a thesis on some phase of industrial education; 3 hours. Credit, 3.

Professor HART.

3. METHODS. — A study of mental growth; the theory and practice of teaching; school organization and methods of instruction; the place and function of agriculture in the course of study. Primarily for those who have had Course 1 or 2; 2 hours. Credit, 2.

Professor HART.

4. TEACHERS' AGRICULTURE. — Designed primarily for those who intend to teach; may be taken in connection with Course 3. The work consists of the selection and review of such parts of the courses in agriculture, horticulture and the biological and physical sciences as are adapted to the work of the public schools; planning, and practical work in school gardens; decoration of school grounds;

equipment and conduct of playgrounds. One lecture period, 2 two-hour laboratory periods. Credit, 3.

Professor HART and Assistant Professor JENKS.

5. SEMINAR IN EDUCATION.—For students who have had courses 1, 2 and 3, or an equivalent. Topics that may be taken up for rather exhaustive study are: legislation and agricultural education, the place and value of agricultural science in school courses, etc. Seniors and graduate students; 2 hours. Credit, 2.

Professor HART.

6. SEMINAR IN EDUCATION.—As stated under Course 5.

Professor HART.

DIVISION OF AGRICULTURE.

Professor FOORD, Dr. BROOKS, Associate Professor LOCKWOOD, Associate Professor MCLEAN,¹ Assistant Professor HASKELL, Mr. GRIBBEN,² Mr. ROBINSON.

Sections.

AGRICULTURE.

AGRONOMY.

ANIMAL HUSBANDRY.

DAIRYING.

FARM ADMINISTRATION.

Agriculture.

Required Courses.

2. ELEMENTARY AGRICULTURE.—A brief course touching upon the application of science to the common things of the farm. The work of the agricultural experiment stations and its relation to farm practice will be considered. Lectures, text-book and laboratory. Freshmen; 1 laboratory and 1 lecture period. Credit, 2.

Elective Courses.

3. AGRICULTURAL SEMINAR.—A brief survey of current agricultural literature, open to juniors and seniors electing work in the Division of Agriculture. Topics will be assigned and reports required. One hour. Credit, 1. Professor FOORD.

¹ Beginning with second semester.

² Up to Jan. 20, 1911.

*Agronomy.**Required Courses.*

1. SOILS AND FERTILIZERS. — A study of the formation, classification and physical and chemical properties of soils. This is followed by study of methods of soil improvement and of maintenance of fertility, including the use of farm manures, commercial fertilizers and soil amendments. Prerequisites, Chemistry 1 and 2. Sophomores; 3 lecture hours. Credit, 3.

Assistant Professor HASKELL.

Elective Courses.

3. FIELD AND FORAGE CROPS. — History, classification, cultivation and harvesting, commercial grading and valuation. The crops studied are the cereal grains, grasses, legumes, forage crops, and those "money crops" of importance in New England. The laboratory work includes the testing of the purity and vitality of the seeds of the different field crops, valuation and judging thereof, and study of the varieties suited to New England conditions. Prerequisites, Agronomy 1 and Botany 2; 2 lectures and 1 laboratory period. Credit, 3.

Assistant Professor HASKELL.

4. FIELD CROP IMPROVEMENT. — A study of the influences determining the yield and value of field crops, and of methods of selecting seed and plant with reference to crop improvement. Particular attention is given to the breeding of plants for early maturity, hardiness and disease resistance, so as to fit them to New England conditions. Lectures, laboratory and field work. Prerequisite, Agronomy 3; 1 lecture and 1 laboratory period. Credit 2.

Assistant Professor HASKELL.

6. ADVANCED SOILS. — Theoretical and practical work on irrigation and drainage; soil survey, with the view of observing the relation between types of soil and natural vegetation; soil mapping. Lectures, laboratory and library work; 1 lecture and 2 laboratory periods. Prerequisites, Agronomy 1 and Mathematics 8. Credit, 3.

Assistant Professor HASKELL.

8. MANURES AND FERTILIZERS. — An advanced course, giving a general discussion of the different theories which have been held relative to the functions and importance of manures and fertilizers,

and leading up to the views at present accepted. Each of the important manures and fertilizers will be discussed, its origin and its chemical and physical characteristics being considered. Each material taken up will be studied in relation to its capacity to supply plant food and to its effects upon soil texture, moisture, temperature and flora. Considerable attention will be devoted to consideration of the experimental work which has been done, and which is now in progress, in manures and fertilizers. Prerequisite, Agronomy 1; 3 lectures a week, with occasional seminars. Credit, 3.

Dr. BROOKS.

Animal Husbandry.

Elective Courses.

2. TYPES AND BREEDS OF FARM ANIMALS. — A general introductory course. The development, characteristics and adaptability of the more common breeds of farm live stock. Lectures; Plumb's "Types and Breeds of Farm Animals." Sophomores; 2 lecture periods and 1 laboratory period. Credit, 3.

Associate Professor McLEAN.

3. PRINCIPLES OF LIVE STOCK IMPROVEMENT. — A careful study of the principles of inheritance, and a discussion of methods of improving herds or individual animals, of crossing and grading in the production of market and farm stock. Prerequisite, Course 2; 3 lecture periods; library references. Credit, 3.

Mr. GRIBBEN, [Associate Professor McLEAN.]

4. DAIRY CATTLE. — Score cards as applied to breed type and their use in scoring for advanced registry; herd book study. One object is to acquaint the student with the various families of the different breeds, their producing powers and external characteristics. The men who will represent the college in judging contests will be chosen from those electing this course, according to the merit of their work. Text-book, lectures and laboratory work; text-book, Craig's "Live Stock Judging." Prerequisite, Course 2; 2 laboratory periods. Credit, 2.

Associate Professor McLEAN.

5. HORSES, SHEEP AND SWINE. — A course similar to Course 4, but dealing with different classes of stock. Of necessity, the study cannot be so detailed as that made in the preceding course, yet a good working knowledge of the judging of these classes is aimed at.

The course will consist largely of judging practice, with some periods devoted to lectures, covering such topics as unsoundness in horses and the determination of age in domestic animals. Text-book, lectures and laboratory work. Craig's "Live Stock Judging." Prerequisite, Course 2; 2 laboratory periods. Credit, 2.

Mr. GRIBBEN, [Associate Professor McLEAN.]

6. FEEDING AND MANAGEMENT OF FARM LIVE STOCK. — The principles of nutrition; their relation to stock feeding; the balanced ration; feeding standards; feed stuffs, method of manufacture, economy to the feeder; economical feeding and management of farm animals; feeding for special purposes (as of dairy cows for records and in preparation for public sales or exhibitions). Text-books and lectures; text-books, Henry's "Feeds and Feeding" and Jordan's "Feeding Farm Animals;" experiment station bulletins. Students electing this course are advised to present Chemistry 5 and 6 and register in veterinary science; 3 hours. Credit, 3.

Associate Professor McLEAN.

Dairying.

Elective Courses.

1. MILK AND ITS COMPOSITION. — The development of the dairy business in the United States; the composition, secretion and general characteristics of milk; contamination and fermentation; methods in economic milk production; methods for testing herds and developing them to higher efficiency; the study of analysis of milk products by use of the Babcock test for fat, test for acidity and adulteration, and ordinary preservatives; moisture tests for butter; problems. Must be preceded or accompanied by Animal Husbandry 3; 2 lecture hours and 1 laboratory period. Credit, 3.

Associate Professor LOCKWOOD.

2. MARKET MILK. — A study of the market milk conditions, extent and development of the business, supply and delivery; food value of milk and its use as food; milk and its relation to the public health; methods for the proper handling and preparing of milk and cream for direct consumption; certified milk, requirements and production; pasteurizing, sterilizing, standardizing and modifying; milk laws and inspection; a study of bacteriology relative to milk and dairy work. Must be preceded or accompanied by Animal Husbandry 4. Prerequisite, Course 1; 2 lecture hours and 1 laboratory period. Credit, 3.

Associate Professor LOCKWOOD.

3. BUTTER MAKING. — A study of hand and factory separators, separator construction and cream separation; handling milk and cream for butter making on the farm and in the factory; preparation of home-made and commercial starters, and ripening cream; churning; recording work; markets and their requirements; marketing, scoring and judging butter; management; problems; dairy-building construction; plans for dairy buildings, arrangement, ventilation, light, sanitation; dairy machinery and care thereof; practical mechanics as applied to the creamery; cement construction as related to dairy construction work. Prerequisites, Courses 1 and 2; 2 lecture hours and 1 laboratory period. Credit, 3.

Associate Professor LOCKWOOD.

4. MANUFACTURED MILK PRODUCTS. — Manufacture of other dairy products than butter. Cheddar and fancy cheeses; condensed milks; whey butter, cottage cheese, ice cream, casein, milk powder, etc.; dairying in other countries; library work. Must be preceded or accompanied by Animal Husbandry 6. Prerequisites, Courses 1, 2 and 3; 2 lecture hours and 1 laboratory period. Credit, 3.

Associate Professor LOCKWOOD.

Farm Administration.

Elective Courses.

3. FARM EQUIPMENT. — A study of the material equipment of the farm aside from the land; farm buildings, their location, plan and arrangement; water supply; fencing problems; farm power; farm machinery; wagons. Prerequisite, Agronomy 1, Animal Husbandry 2 and Mathematics 5; 2 laboratory periods and 1 lecture hour. Credit, 3.

Professor FOORD.

4. FARM MANAGEMENT. — The organization of the farm as a business enterprise. A discussion and study of some of the problems that confront the modern farmer, such as the choice of a farm, systems and types of farming, labor, marketing, records and farm accounts. Prerequisites, Agronomy 1 and 3 and Animal Husbandry 2; 2 lecture or recitation hours and 1 seminar period. Credit, 3.

Professor FOORD.

Department of Botany.

Professor STONE, Assistant Professor OSMUN.

[The object of the courses in botany is to teach those topics pertaining to the science which have a bearing upon economic and scientific agriculture. Undergraduate work extending through five semesters is offered. Considerable latitude is allowed students in the senior year in their electives; and, besides the courses here outlined, students often take up the study of histology or of systematic botany, the microscopic examination of pure and adulterated human and cattle foods, spices and drugs, etc. Students sufficiently prepared are occasionally permitted to undertake special physiological and pathological investigations. A botanical conference is held monthly wherein new problems in botanical science are considered by graduate students and the seniors who elect botany.]

Required Courses.

2. HISTOLOGY, PHYSIOLOGY, MORPHOLOGY AND CLASSIFICATION OF PLANTS. — This course is divided into two parts: Part I. extends to the first week in May; Part II. occupies the remainder of the semester. Part I.: Devoted to study of the minute structure and the function of stems, leaves, roots and seeds, and of the chemical composition of plant constituents. The laboratory work consists largely of microscopic study of plant structures, with some time devoted to chemical tests for plant constituents. The lectures aim to amplify and interpret the laboratory work, and to explain the inter-relation of structure and function. Part II.: The laboratory periods are employed in the study of morphology and plant analysis. Lectures are given in morphology, ecology, evolution and taxonomy. Each student is required to collect and prepare an herbarium of 75 species of native plants. Gray's "New Manual of Botany" is used in determining and naming plants. Though only one lecture period is scheduled for this course, it is understood that laboratory hours may be used for lectures at the discretion of the instructor. Sophomores; 3 two-hour laboratory periods and 1 lecture hour. Credit, 4. Assistant Professor OSMUN.

Elective Courses.¹

3. CRYPTOGAMIC BOTANY. — Systematic study of typical forms of the lower plants (bacteria, algæ, fungi, lichens, mosses and ferns); instruction in laboratory technique and methods, and the making of herbaria of lichens, mosses and ferns. Laboratory work and lectures; field excursions for the purpose of observing environmental habits and collecting material for laboratory study; collateral reading. This course is intended for those students who wish to specialize in biology; its purpose is to afford more thorough

¹ Students electing any of the junior work may take botany in their senior year, and those specializing in chemistry may take plant physiology in their senior year without having had the junior work in botany.

scientific training than is offered in Course 5, and students electing this course will attend the lectures in Course 5. Juniors; 3 two-hour laboratory periods and 1 lecture hour. Credit, 4.

Assistant Professor OSMUN.

4. CRYPTOGRAMIC BOTANY. — This is a continuation of Course 3. Prerequisite, Course 3. Juniors; 1 two-hour laboratory period and 1 lecture hour. Credit, 2.

Assistant Professor OSMUN.

5. PLANT PATHOLOGY. — This course comprises a study of the common diseases of crops and consideration of the methods for their prevention and control, and is intended especially for students in horticulture and agriculture. Laboratory work and lectures. The work in pathology is preceded by a brief study of the lower cryptogams. Juniors; 1 two-hour laboratory and 1 one-hour lecture period. Credit, 3.

Professor STONE and Assistant Professor OSMUN.

7. PLANT PATHOLOGY. — This course includes a study of the diseases of one or more crops and the methods of controlling them. Laboratory work and lectures, together with extensive reading of experiment station literature. The course is intended for those who wish to become more familiar with the diseases of one or more groups of economic plants. Seniors; those students continuing in botany must take Course 8; 3 three-hour laboratory periods and 1 lecture period. Credit, 5.

Professor STONE.

8. PLANT PATHOLOGY. — As stated in Course 7. Prerequisite, Course 7.

Professor STONE.

9. ECONOMIC FUNGI. — This course comprises the study of economic fungi from a taxonomic point of view, and is intended for those who wish a more comprehensive knowledge of the phylogenetic relationships of fungi. Laboratory work and lectures. Tubeuf & Smith's "Diseases of Plants" is used as a guide, with special monographs on fungi and with the more important experiment station literature treating of the life history of fungi. Seniors; must be followed by Course 10; 2 or 3 three-hour laboratory periods and 1 one-hour lecture period. Credit, 4 or 5.

Professor STONE.

10. ECONOMIC FUNGI. — As stated in Course 9. Prerequisite, Course 9.

Professor STONE.

11. PLANT PHYSIOLOGY. — This course is largely experimental, and is especially adapted to the needs of students who are taking chemistry. Laboratory work and lectures; various handbooks on plant physiology. Seniors; must be followed by Course 12; 3 three-hour laboratory periods and 1 one-hour lecture period. Credit, 5.
Professor STONE.

12. PLANT PHYSIOLOGY. — As stated in Course 11. Prerequisite, Course 11.
Professor STONE.

13. PHYSIOLOGY AND PATHOLOGY OF SHADE TREES. — This course includes a comprehensive study of the diseases, structure and functions of trees and shrubs, and of every agency which in any way affects shade trees. Laboratory work and lectures; extensive reference reading. Designed for those students who intend to take charge of parks or large estates, or to become tree wardens, city foresters, landscape gardeners or professional advisers and caretakers. Seniors; must be followed by Course 14; 2 three-hour laboratory periods and 1 one-hour lecture period. Credit, 4.
Professor STONE.

14. PHYSIOLOGY AND PATHOLOGY OF SHADE TREES. — As stated in Course 13. Prerequisite, Course 13.
Professor STONE.

Department of General and Agricultural Chemistry.

Professor WELLINGTON, Associate Professor CHAMBERLAIN, Assistant Professor HOWARD.

[The courses in chemistry aim to teach accurate observation, logical thinking and systematic and constant industry, together with a comprehensive knowledge of the subjects presented. Instruction is given through text-books, lectures and a large amount of laboratory work under supervision. The laboratory work at first consists of the study of the properties of elementary matter, the analysis of simple combinations, and their artificial preparation. This is followed by the quantitative analysis of salts, minerals, soils, fertilizers, and the chemistry of various manufacturing industries, especially those of agricultural interest, such as are concerned in the production of sugar, starch and dairy products; the preparation of animal and plant foods, their digestion, assimilation and economic use; and the official analysis of soils, insecticides, fungicides, waters, milk, wine, and other animal and vegetable products.]

Required Courses.

1. THE NON-METALS. — An introduction to chemical laws. The commoner non-metallic elements, their occurrence in nature, and their uses in the arts, are studied. Lectures and laboratory exercises. Freshmen; 4 hours. Credit, 3.

Assistant Professor HOWARD.

2. THE COMMON METALS. — This course extends the study of Course 1 to the metals common in the arts, and includes blowpipe analysis and elementary determinative mineralogy. Lectures, recitations and laboratory exercises. Prerequisite, Course 1. Freshmen; 4 hours. Credit, 3.

Assistant Professor HOWARD.

Elective Courses.

3. GENERAL CHEMISTRY. — This course makes a more thorough study of the physical laws and typical reactions than is made in Courses 1 and 2. For all students intending to specialize in chemistry this course is required. Prerequisite, Course 2. Lectures, 1 hour; laboratory, 4 hours. Credit 3.

Assistant Professor HOWARD.

4. QUALITATIVE ANALYSIS. — A course in the systematic analysis of the important metals and acids and their salts. Students electing advanced courses in chemistry should take this course. Lectures and laboratory work; Medicus's "Qualitative Analysis." Prerequisite, Course 2. Sophomores; 6 hours. Credit, 3.

Assistant Professor HOWARD.

5. ORGANIC CHEMISTRY. — This course, with Course 6, continues through the junior year. The two courses are designed especially: (1) for those who are looking forward to positions as chemists in agricultural colleges or experiment stations, the United States Department of Agriculture, or similar places, and who need a knowledge of chemistry for itself; and (2) for those who are expecting to enter like positions in other sciences, and who will use their knowledge of chemistry in a secondary way. It consists of a systematic study, both from texts and in the laboratory, of the more important compounds in the entire field of organic chemistry; and forms a foundation for courses in physiological chemistry and agricultural analysis, and thus for possible future work in agricultural chemical investigation. Prerequisites, Courses 1, 2 and 4. Those electing Course 5 are expected to elect Course 6. Juniors; lectures, 3 hours; laboratory, 4 hours. Credit, 5.

Associate Professor CHAMBERLAIN.

6. — As stated under Course 5.

Associate Professor CHAMBERLAIN.

7. AGRICULTURAL CHEMISTRY. — A course continuing through the two semesters of the junior year. This course and Course 8 are designed as an alternative for Courses 5 and 6. They are especially intended for those who, having completed Courses 1 and 2, do not care to continue the study of chemistry for itself, but who are planning to enter practical agricultural work and desire a somewhat further knowledge of chemistry as it is related directly to agriculture and agricultural problems. The work is planned in two parts, viz., *Course 7, Inorganic Agricultural Chemistry*, the study of the general composition, properties and reactions of soils and fertilizers, and in addition to this the study of some of the common materials of construction, such as tile, brick, cements, paints, oils, etc.; and *Course 8, Organic Agricultural Chemistry*, the study of plants and animals as to composition, nutritive value and general processes of nutrition and growth, and also the study of products manufactured from them, such as milk, butter, sugar, maple syrup, denatured alcohol, wood pulp, paper, etc. The treatment of the subject in both of these courses is entirely general, avoiding all complicated chemical facts and relationships, and endeavoring simply to make the student acquainted with the chemical aspect of agricultural processes and products. Prerequisites, Courses 1 and 2. Juniors; those electing Course 7 are expected to elect Course 8; lectures, 3 hours. Credit, 3.

Associate Professor CHAMBERLAIN.

8. — As stated under Course 7.

Associate Professor CHAMBERLAIN.

9. QUANTITATIVE ANALYSIS. — A course continuing through the two semesters of the junior year; for those who wish to acquire skill in chemical analysis. Students intending to enter experiment station or chemical-control work have here an opportunity to become familiar with the reactions and processes concerned. Prerequisite, Course 4. Juniors; those electing Course 9 are expected to elect Course 10; lectures, 1 hour; laboratory, 9 hours. Credit, 5.

Professor WELLINGTON.

10. — As stated under Course 9.

Professor WELLINGTON.

13. PHYSIOLOGICAL CHEMISTRY, VEGETABLE. — This course and Course 14 are intended to be supplementary to Courses 5 and 6 and Courses 7 and 8. To those who expect to take up scientific

work, and who have had Courses 5 and 6, Course 13 will give acquaintance with the chemistry of the physiological processes in plants, and the action of physiological substances. Together with Course 14, it gives additional training in the chemical problems of agricultural experiment station work, and it will, with the courses in analytical chemistry, fit men for such work. To those who will not take up scientific lines of work, but will follow practical agriculture, it will give additional knowledge of the facts and processes with which they will meet. It will consider more exactly and in greater detail the chemical and physiological aspect of problems which were treated generally in Courses 7 and 8. Prerequisites, Courses 5 and 6, or 7 and 8. Seniors; lectures, 2 hours; laboratory, 2 hours. Credit, 3.

Associate Professor CHAMBERLAIN.

14. PHYSIOLOGICAL CHEMISTRY, ANIMAL. — A continuation, or counterpart, of Course 13, but dealing with animals. Prerequisites, Courses 5 and 6, or 7 and 8. Seniors; lectures, 2 hours; laboratory, 2 hours. Credit, 3.

Associate Professor CHAMBERLAIN.

15. CHEMICAL PROBLEMS. — A course in the historical progress of agricultural chemistry. The inception and growth of modern knowledge in agricultural chemistry will be intimately studied for the purpose of familiarizing the student with the experimental work and the logical processes of the more notable achievements in this department of chemistry. The course includes work in the biography and literature of research, as well as general chemical history. The classic works of Liebig, Wöhler, Liebermann, Baeyer, Gilbert, Henneberg, Tollens, Fischer and others will be taken up. In the light of the studies made, present-day problems in agricultural chemistry will be examined and methods for their solution tried. Prerequisites, Courses 5 and 6, 9 and 10, 11, 13, 14. Open to students only by permission; lectures, reading and laboratory work; 1 lecture and 4 laboratory periods. Credit, 5.

Professor WELLINGTON.

17. CHEMICAL PRACTICE IN AGRICULTURE. — This course and Course 18 are divided into subcourses as follows:—

A. *Analysis of Fertilizers, Insecticides and Fungicides.* — The theory, with a large amount of practice in this subject, is given under the close supervision of a teacher. The methods followed are in the first place comparative. Then the preferred official methods

are intimately studied, especially with reference to their limitations. The students are impressed with the fact that, even at this late day, all of these methods require revision, and are only awaiting the clear head of the learned man and the expert technician for their improvement. Prerequisite, Course 4. Seniors; lectures 1 hour, laboratory 9 hours. Credit, 5.

B. Analysis of Foods and Fodders. — This course is pursued in a method uniform with that of Course 17A. Both courses are intended to fit men for experimental station and control work, as well as for research efficiency. The latest results of alimentation, physiology and the composition of foods and condiments are studied. The students will be urged to make inquiry for themselves in the fields of study. Prerequisites, Courses 5 and 6, 9 and 10, 13; co-requisite, Course 14; lecture 1 hour, laboratory 9 hours. Credit, 5.

C. Chemistry of Sugar Making and Refining. — In this course, after the chemical character of sugar and its function as a food have been determined, the theory and practice of the subjects named will be intimately studied. This involves practice in the analysis of many common chemicals, minerals and manufactured products, such as limestone, coal, boneblack, sulphites, clays, etc. The behavior of sugars and allied substances toward light, qualitatively and quantitatively, is investigated. The students are fitted for service in sugar houses and sugar refineries. Prerequisite, Courses 5 and 6; lectures 1 hour, laboratory 9 hours. Credit, 5.

D. Dairy Chemistry. — This course takes up instruction in the various processes of dairy chemistry, including chiefly the analysis of foods for dairy animals and the dairy products. Given in alternate years; given in 1910–11. Open only on permission; lectures 1 hour, laboratory 6 hours. Credit, 3. Professor WELLINGTON.

18. CHEMICAL PRACTICE IN AGRICULTURE. — As stated under Course 17. Professor WELLINGTON.

19. SANITARY CHEMISTRY. — This course is planned to bring into striking and intimate relationships many hitherto missing facts between the science of the lecture room and laboratory and the actual practice of living as it is pursued in every condition in which a person finds himself between birth and death. It is hoped that this course will impart to every one who takes it new conceptions of the functions and duties of practical life. It is believed that,

through carefully and minutely demonstrated experiments, this end will be attained. Given in alternate years; not given in 1910-11. Open only on permission; lectures 2 hours. Credit, 2.

Professor WELLINGTON.

Department of Entomology.

Professor FERNALD, Mr. SUMMERS.

[A knowledge of insects is of importance in every department of life, and particularly in connection with agriculture, horticulture, biology, landscape gardening and forestry; it therefore forms part of a general education. An introductory course in this subject is accordingly offered in the junior year. For those who desire a further knowledge of the subject, because of its importance to their future occupation, a senior course is also offered, so arranged as to be of especial value for those who expect to take up agriculture, horticulture, landscape gardening, forestry or science teaching.]

Elective Courses.

2. GENERAL AND ECONOMIC ENTOMOLOGY.—This course comprises studies in the structure of insects as applied to their identification, and in the principles of classification; a systematic examination of the different groups and of the most important economic insects of each group, including their life histories and habits, recognition of their work as shown in the collection and in the field, and methods for their control. The most important insecticides, and their preparation and application with different kinds of apparatus are also treated. Field work in collecting insects is a part of the course; and this is accompanied by laboratory work on methods of pinning, pressing and mounting insects, and of classifying them. Juniors; 4 one-hour lecture periods till about May 1; thereafter 1 one-hour lecture period and 3 two-hour laboratory or field periods. Credit, 4.

Professor FERNALD.

3. ADVANCED ENTOMOLOGY.—This course is subdivided according to the particular needs of those taking it, and is to a large degree given in the form of individual instruction.

A. *Morphology*.—Careful studies of the structure of insects belonging to each of the larger and more important orders, together with lectures on the subject, followed by the identification of insects of each of these groups and the study of the collections, to teach the use of the analytical tables and of structural characters in the determination of insects.

B. *Histology*.—Lectures on the internal anatomy and histology of the various organs, with particular reference to those affected by the various insecticides.

C. Insecticides and Apparatus.—Lectures on the chemistry, preparation and application of the different insecticides, their merits and defects, tests for detecting adulterations; and a study of other methods of insect control, together with laboratory work on adulterated materials.

D. Coccidology.—Laboratory work on methods of preserving, mounting and identifying scale insects, particular attention being given to those of greatest economic importance.

E. Bibliography.—Studies of the various entomological publications and of the methods of finding the literature on any insect.

F. Special Studies.—In these studies the insects most closely related to the future occupation of the student will receive attention. The results of these studies are brought together in the form of an essay or thesis; this will include all the essentials of what is known of the structure, life history, habits and injuries caused by each insect studied, together with methods of treatment, and a list of the best articles found in the course of the work. Comstock's "Manual for the Study of Insects" is used in the laboratory work. Seniors; prerequisite, Entomology 2; students electing 3 must also take 4; 1 one-hour lecture period and 3 two-hour laboratory or field periods. Credit, 4.

Professor FERNALD and Mr. SUMMERS.

4. ADVANCED ENTOMOLOGY.—As stated in Course 3. Prerequisite, Course 3.

Professor FERNALD and Mr. SUMMERS.

DIVISION OF HORTICULTURE.

Professor WAUGH, Professor SEARS, Professor WHITE, Associate Professor MOON, Mr. HELLER, Mr. NOYES, Mr. NORMAN, Mr. RANE.

Departments.

HORTICULTURE.

POMOLOGY.

FLORICULTURE.

LANDSCAPE GARDENING.

FORESTRY.

MARKET GARDENING (SECTION).

DRAWING (SECTION).

Department of Horticulture.

[The general subject of horticulture divides naturally into the subjects of pomology, floriculture, landscape gardening and market gardening. A number of courses relate to more than one of these subjects, and are therefore here grouped under the general designation of horticulture.]

Required Courses.

2. NURSERY PRACTICE. — This course treats of the fundamental operations of horticulture — propagation, pruning, cultivation — as related to the physiology of the plant. Lectures and practicums; Bailey's "Nursery Book" as text in propagation. Sophomores; 2 hours. Credit, 2. Mr. NORMAN.

Elective Courses.

3. PLANT MATERIALS. — This course aims to make the students familiar with the character of the trees, shrubs and herbaceous perennials used in ornamental work, and with the methods of propagating them. Prerequisite, Horticulture 2; 2 lecture periods and 1 laboratory period. Credit, 3. Professor WHITE.

4. PLANT MATERIALS. — A continuation of Course 3, taking up the field use of trees, shrubs and herbaceous plants, their native habitats, soils and plant associations, with a view to supplying to students in landscape gardening and floriculture a knowledge of plant species. Frequent practicums and field excursions. Prerequisite, Horticulture 3; 2 lecture periods and 1 free afternoon. Credit, 3. Professor WHITE.

6. PLANT BREEDING. — This course is designed to introduce advanced students to the best modern views of variation, heredity and evolution, and to the best methods of studying the phenomena found in these subjects. The principles educed apply to both animal breeding and plant breeding, but the laboratory work (of which there is considerable) is concerned chiefly with plant life. Some practice work in hybridization and selection is undertaken, and students are trained as far as possible in the practical application of those principles which have direct bearing on the breeding of plants and the cultivation of crops. Seniors and graduates; open only to students well prepared in agricultural or horticultural subjects; 2 lecture periods and 1 two-hour laboratory period. [Not given in 1910-11.] Credit, 3.

*Department of Pomology.**Elective Courses.*

1. PRACTICAL POMOLOGY. — *General.* — A study of the general principles of the growing of fruits, dealing with such questions as selection of site, soils, windbreaks, laying out plantations, choice of stock, pruning, spraying, etc. Text and reference books; field and laboratory exercises. Prerequisite, Horticulture 2. Juniors; 5 hours. Credit, 3. Professor SEARS.

2. PRACTICAL POMOLOGY. — *Special.* — The special application of the general principles discussed in Course 1 to the culture of the principal kinds of fruits, such as apples, pears, peaches, plums, cherries and quinces; grape culture and the culture of small fruits, such as blackberries, raspberries, currants, gooseberries and strawberries. Text-books, lectures and reference books; field and laboratory exercises. Prerequisites, Horticulture 2 and Pomology 1. Juniors; 5 hours. Credit, 3. Professor SEARS.

3. SYSTEMATIC POMOLOGY. — A study of the varieties of the different fruits and of nomenclature, with critical descriptions; special reference being given to relationships and classification. Text-books, laboratory and field exercises. Prerequisites, Horticulture 2 and Pomology 1 and 2. Seniors; 5 hours. Credit, 3. Professor SEARS.

4. COMMERCIAL POMOLOGY. — The storing and marketing of fruits; includes a discussion of storage houses, the handling and storing of fruits, fruit packages, methods of grading and packing, etc. Text and reference books; laboratory exercises. Seniors; prerequisites, Horticulture 2, Pomology 1, 2 and 3; 5 hours. Credit, 3. Professor SEARS.

*Department of Floriculture.**Elective Courses.*

1. GREENHOUSE MANAGEMENT. — This course is designed to familiarize students with methods followed in the management of greenhouse crops. The students are instructed in the practical operation of glazing concrete, bench construction, bulb culture, greenhouse watering, fumigating and ventilating, in the care of furnaces, and in the methods of propagation of greenhouse plants

by seeds, cuttings, budding and grafting. This is designed as a laboratory course, and students electing it will be expected to arrange their hours according to the needs of the work. Prerequisite, Horticulture 2. Juniors; 7 hours a week. Credit, 4.

Professor WHITE.

2. GREENHOUSE DESIGN AND CONSTRUCTION. — A continuation of Course 1, including also a study of the location, arrangement and construction of greenhouses; the drawing of plans for commercial and private ranges, to show foundations and details in construction of superstructure; arrangement of heating pipes; estimates of comparative cost of different methods of construction; drafting specifications. Juniors; prerequisite. Floriculture 1; 7 hours. Credit, 4.

Professor WHITE.

3. FALL GREENHOUSE CROPS. — A study of important fall and winter crops and their care, — chrysanthemums, carnations, violets, roses, palms, and the like; the importation, purchase and growth of bulbous material; the preparation of material for forcing; design making; house and church decorating. Lectures, text-books and laboratory exercises. Prerequisites, Floriculture 1 and 2. Seniors; 5 hours. Credit, 3.

Professor WHITE.

4. SPRING GREENHOUSE CROPS. — The culture of individual crops in their relation to spring work in a florist establishment. A critical study of methods of propagating bedding plants, the nature and use of these plants, practice in planting them and in the spring care of herbaceous perennials and wholesale and retail marketing of spring plants. Lectures, text-books and practical exercises. Seniors; prerequisites, Floriculture 1, 2 and 3; 5 hours. Credit, 3.

Professor WHITE.

Department of Landscape Gardening.

Elective Courses.

1. ELEMENTS OF LANDSCAPE GARDENING. — Reconnaissance surveys and mapping, with special reference to the methods used in landscape gardening; detailed study of selected works of leading landscape gardeners; grade design, road design and field work. Students should have preparation in surveying, mathematics, plant materials and drawing. Must be followed by Course 2. Juniors; 7 hours a week. Credit, 4.

Mr. NOYES.

2. ELEMENTS OF LANDSCAPE GARDENING. — As stated under Course 1. Prerequisite, Course 1.

Professor WAUGH and Mr. NOYES.

3. GENERAL LANDSCAPE GARDENING. — Field notes; examination of completed works and those under construction; design of architectural details; planting plans; estimates; written reports of individual problems. Seniors; prerequisites, Landscape Gardening 1 and 2, and either plant materials (Horticulture 3 and 4) or advanced mathematics; must be followed by Course 4; 7 hours. Credit, 4.

Professor WAUGH and Mr. NOYES.

4. GENERAL LANDSCAPE GARDENING. — As stated under Course 3. Prerequisite, Course 3.

Professor WAUGH and Mr. NOYES.

5. THEORY OF LANDSCAPE ART. — The general theory and applications of landscape study, including a brief history of the art. Seniors and graduates; 2 hours. Credit, 2.

Professor WAUGH.

6. ARCHITECTURE. — A course giving the history of architectural development, the different historic types, with special reference to the underlying principles of design and construction and to the applications in landscape architecture. Lectures, illustrated with stereopticon and plates; conferences; practice in design; 2 hours. Credit, 2.

Mr. NOYES.

7. CIVIC ART. — The principles and applications of modern civic art, including city design, city improvement, village improvement and rural improvement. Text-book, Robinson's "Modern Civic Art." Prerequisites, Courses 1, 2 and 3; must be followed by Course 8; 6 hours. Credit, 3.

Professor WAUGH.

8. CIVIC ART. — As stated under Course 7. Prerequisite, Course 7.

Professor WAUGH.

*Department of Forestry.**Elective Courses.*

1. DENDROLOGY AND SILVICULTURE. — These two subjects run parallel throughout the year. Under dendrology, the habits and needs of trees are studied, their distribution, soil and moisture requirements, growth, etc. Under silviculture are taken up the life history of trees and stands; tree characteristics, how modified; the concept of a forest and its subdivisions; methods of reproduction, both natural and artificial, with both theoretical and practical work in thinnings and nursery practice. Juniors; 3 lectures weekly, with 4 additional hours of optional field work. Credit, 3.

Associate Professor MOON.

2. DENDROLOGY AND SILVICULTURE. — As stated under Course 1. Prerequisite, Forestry 1.

Associate Professor MOON.

*Market Gardening.**Elective Courses.*

2. ELEMENTS OF MARKET GARDENING. — A study of market gardening as a business, with detailed consideration of the conditions under which it is practiced. The problems of soil selection and soil management, garden fertilization and tillage, receive attention from the viewpoint of the market gardener, and considerable time is devoted to the study of garden crops. Juniors; prerequisite, Horticulture 2; 3 hours. Credit, 3. Mr. HELLER.

3. ADVANCED MARKET GARDENING. — A continuation of the work begun in Market Gardening 2, taking up problems of seed growing, selection of varieties, crop management, harvesting, storage and marketing. A study is made of the greenhouse vegetable industry, and considerable time devoted to growing the special forced crops. Some time is given to a systematic study of vegetable description, classification and nomenclature. Collateral reading is required. Floriculture 2 must be taken in connection with this course. Seniors; prerequisite, Market Gardening 2; 5 hours. Credit, 3.

Mr. HELLER.

*Drawing.**Elective Courses.*

1. FREEHAND DRAWING. — Lettering; sketching from type models, leaves, fruits, vegetables, flowers and trees, insects and small animals; laying flat and graded washes in water colors; water-color

rendering of fruits, vegetables, leaves, flowers and trees; topographical lettering and conventional signs in ink; conventional coloring; mapping in ink and in water colors. (Was not given in 1909-10.) Juniors; 6 hours. Credit, 3. Mr. NOYES.

2. MECHANICAL DRAWING. — Inking exercises; geometric problems; projection; intersections, isometric; shades and shadows; parallel; angular and oblique perspective; perspective drawing of buildings. Juniors; 6 hours. Credit, 3. Mr. NOYES.

DIVISION OF THE HUMANITIES.

Professor MILLS,¹ Associate Professor NEAL, Assistant Professor EYERLY, Assistant Professor MCKAY, Mr. HOLCOMB, Mr. MACKIMMIE, Mr. ASHLEY, Mr. GREEN, Miss GOESSMANN.

Departments.

ENGLISH.

MODERN EUROPEAN LANGUAGES.

MUSIC (SECTION).

POLITICAL SCIENCE.

LIBRARY.

Department of English.

ENGLISH LANGUAGE; JOURNALISM.

LITERATURE.

PUBLIC SPEAKING.

ENGLISH LANGUAGE.

Required Courses.

1. FRESHMAN ENGLISH.—Composition; introduction to literature. Recitations and lectures; theme writing; conferences.² Freshmen; 4 hours. Credit, 4.

Associate Professor NEAL and Assistant Professor MCKAY.

2. FRESHMAN ENGLISH. — As stated under Course 1. Prerequisite, Course 1; 4 hours. Credit, 4.

Associate Professor NEAL and Assistant Professor MCKAY.

¹ Absent on leave.

² Student assistants (in charge of freshman groups for tutoring in spelling, punctuation and similar elementary matters; theme readers). Class of 1911: Herbert Jonathan Baker (second year); Edgar Morton Brown (second year, semester one); Leonard Matthews Johnson (second year); Bernard Ostrolenk (second year). Class of 1912: Royal Norton Hallowell (semester one), Marshall Cotting Pratt, Lawrence Peck Rockwood, Lewis Raymond Sellow (second semester).

3. SOPHOMORE ENGLISH.¹ — Composition; literature. Prerequisite, Course 2; sophomores; 2 hours. Credit, 2.

Associate Professor NEAL.

4. SOPHOMORE ENGLISH.¹ — As stated under Course 3. Prerequisite, Course 3.

Assistant Professor MCKAY and Miss GOESSMANN.

7. TRAINING COURSE. — A course (*a*) required of student assistants in English, and (*b*) open (with the instructor's consent) to candidates for a tutorship. Candidates are expected to take it in qualifying for appointment. The course may be taken for either sophomore or elective credit. Two hours. Credit, 2.

Associate Professor NEAL.

8. TRAINING COURSE. — As outlined under Course 7.

Associate Professor NEAL.

A. *Use of Library.* — Lectures on the use of the Library. Hours to be appointed. Required of all sophomores in the first semester as part of Course 3.

Mr. GREEN.

[Enrolment in the elective courses in the Department of English is subject to the approval of the instructor. The membership in several of the courses is strictly limited; hence students are advised to plan their work well in advance in order to be sure of completing the required three hours of post-sophomore English. This credit must be made up without taking Literature 15 or 16.]

ENGLISH LANGUAGE AND JOURNALISM.

Elective Courses.

9. JOURNALISM.² — Under the title "Journalism" are grouped agricultural journalism, newspaper and periodical writing and a somewhat more advanced study of journals and journalistic writing. All these courses are closely related. In the beginning, the course in agricultural journalism and that in periodical writing are identical; the introductory work in periodical writing — such

¹ Students whose work in Courses 1 and 2 reaches a standard satisfactory to the Department may be excused from not more than half of the sophomore work in English. At present, students in Course 3 or Course 4 are permitted, under restrictions to be stated by the Department, to substitute Public Speaking for English Language and Literature.

² The attention of students who elect courses in Journalism is specially directed to the courses given in the collateral subjects here mentioned: Agricultural Education, especially Courses 1 (Psychology) and 2; French; German; Spanish; Political Science; Rural Social Science; English Language and Literature; Public Speaking. By judicious election among the scientific courses and among courses in the subjects named above, a student wishing to follow either agricultural or general journalism can broadly and effectively prepare himself for the profession.

as desk editing, proof reading, and especially the writing of news stories in simple reporting style — being deemed necessary as training preparatory to any kind of journalistic work. The chief differences between the courses are, (1) that Course 9A (agricultural) opens more immediate opportunities for practical work, as publication for a limited amount of the student writing is found in agricultural periodicals; and (2) that Course 9B (periodical) opens the way for more varied observation and investigation, and for more varied experience in writing, contributing in these ways to general culture, as Course 9A contributes to specialized training. In addition, the course in periodical writing has in mind the increasing importance of rural journalism as an influence and occupation in the developed rural community.

A. Agricultural Journalism. — The production of “copy” adapted to the use of agricultural periodicals. The class, organized as an editorial staff, is charged with the preparation of an agricultural periodical. Two hours. Credit, 2.

B. Newspaper and Periodical Writing. — The elements of journalism — newspaper and magazine writing, reporting, editing, printing, etc. The class, organized as an editorial staff, is to issue a periodical. It is responsible for “covering” events, desk editing, copy and proof reading, making “dummies” and writing legends for illustrations, completing “forms” and “publishing” the periodical upon schedule time, etc. The first semester will be devoted principally to newspaper writing; the second semester to periodical writing. Two hours. Credit, 2.

[C. Proseminar in Journalism. — Informal, beginning with a study by individual students of editorial writing and of types of magazine writing, such as “descriptive” articles, research articles, “human interest” articles, and articles in “popularized” science. Members of the class are expected to formulate through these studies theories of journalism and journalistic writing, to state them in thesis form, and to produce articles of the kinds studied. Reference reading and reports upon current periodicals may be called for. Given only by special arrangement. One hour. Credit, 1.]

9A and 9B may be taken at the same time.

Associate Professor NEAL.

10. JOURNALISM. — As stated under Course 9.

Associate Professor NEAL.

15. ENGLISH LANGUAGE. — See Literature 15.

16. ENGLISH LANGUAGE. — See Literature 16.

[17. ADVANCED COMPOSITION. — A course varying in plan, but usually concerned with some form of exposition, description or narration. Not given in 1910-11. Two hours. Credit, 2.

Associate Professor NEAL.]

LITERATURE.

Required Courses.

1, 2, 3, 4, 7 and 8. — See the courses so numbered under "English Language."

Elective Courses.

9. CULTURAL READING.¹ — Individual reading courses intended to encourage broader acquaintance with (*a*) literature, (*b*) art, (*c*) philosophy (including psychology), or (*d*) history (including political and social science). The reading must be sufficient to require forty-five hours; must be entirely non-technical; may be in any of the subjects indicated above; must not consist in research; and may—subject strictly to its purpose—be taken in any department by arrangement between the student and the instructor in the department concerned. If the reading be taken outside the Department of English, the student must present in writing the consent of the instructor under whom he wishes to read. Each student must present a two-thousand-word paper and a notebook. Prerequisite, the sophomore courses in English; total credits allowed to one student for cultural reading work, 2. Credit, 1.

Associate Professor NEAL.

10. CULTURAL READING. — As stated under Course 9.

Associate Professor NEAL.

13. LITERARY HISTORY. — A course dealing with literary periods or with authors; in 1910-11, Elizabethan literature. Lectures, text-book and reference assignments, and class-room interpretation of authors; much outside reading; written studies upon

¹ Courses in semester one include: Poe, Kipling, Stevenson, English fiction in the nineteenth Century, Carlyle, American prose, Wordsworth, Tennyson, psychology, evolution; and, outside the Department of English, biography of great chemists, political science, and landscape art.

announcement. Given upon application. Prerequisite, the sophomore courses in English. Two hours. Credit, 2.

Associate Professor NEAL.

14. LITERARY HISTORY. — As outlined under Course 13. In 1910–11, Tennyson. Associate Professor NEAL.

[15. ENGLISH LANGUAGE AND LITERATURE. — The origin, history and development of the English language; essayists and novelists of the nineteenth century. Continuous with Course 16. Not given in 1910–11. Seniors; 3 hours. Credit, 3.

Professor MILLS.]

[16. ENGLISH LANGUAGE AND LITERATURE. — Continuous with Course 15. The elements of literary criticism; nineteenth century poets. Not given in 1910–11. Seniors; 3 hours. Credit, 3.

Professor MILLS.]

18. ADVANCED LITERATURE. — This course varies from year to year. It will usually provide opportunity either for intensive study of great writers or for study of the historical development or the structure and characteristic of literary types; in 1910–11, the English novel. Open only upon arrangement. Tests and examinations. Two hours, with a third hour at the option of the instructor. Credit, 2.

Associate Professor NEAL.

PUBLIC SPEAKING.

Required Courses.

1. FRESHMAN PUBLIC SPEAKING. — Freshman public speaking is required in either the first or the second semester, at the option of the instructor. Voice exercises; practice in the delivery of declamations and interpretive readings. Freshmen; 1 hour. Credit, 1.

Assistant Professor MCKAY.

2. FRESHMAN PUBLIC SPEAKING. — As stated under Course 1. Required of all freshmen who are not assigned to take Course 1.

Assistant Professor MCKAY.

3. SOPHOMORE PUBLIC SPEAKING. — Original speeches on assigned topics and declamations, supplemented by exercises in voice development and gesture. Elective within the English Depart-

ment, as stated under English Language 3. Prerequisite, Course 1 or 2, or its equivalent. Sophomores; 1 hour. Credit, 1.

Assistant Professor McKAY.

4. SOPHOMORE PUBLIC SPEAKING. — Work of the same character as in Course 3, but more advanced. This course offers practice in the making of longer original speeches, in declamation, debating and dramatic reading. Elective within the English Department, as stated under English Language 3. Prerequisite, Course 3. Sophomores; 1 hour. Credit, 1.

Assistant Professor McKAY.

Elective Courses.

8. ORATORY. — Speeches on assigned topics; prescribed reading; the preparation and delivery of an oration, supplemented by a study of the principles of oratorical composition and delivery. It is especially recommended for those who desire to enter the Flint contest. Prerequisite, Course 3; 1 hour. Credit, 1.

Assistant Professor McKAY.

9. DEBATING. — Considerable time is given to the study of argumentation and brief-drawing. The class is divided into teams for the platform discussion of leading questions of the day. This course is designed to develop readiness in extempore speaking. It is recommended for those who desire to enter the intercollegiate debates. Prerequisite, Course 3; 2 hours. Credit, 2.

Assistant Professor McKAY.

10. DRAMATIC READING. — Exercises for voice and gesture; a study of the elements of vocal expression and action; expressional reading of selections in prose and poetry; presentation of scenes from plays. Prerequisite, Course 3; 1 hour. Credit, 1.

Assistant Professor McKAY.

Department of Modern European Languages.

FRENCH.

Required Courses.

1. ELEMENTARY FRENCH. — A beginning course. Fraser & Squair's "French Grammar;" reader; graduated texts. Required of freshmen presenting German for entrance who do not continue that language and have not studied French; open upon arrangement to other students. Freshmen; 4 hours. Credit, 4.

MR. MACKIMMIE.

2. ELEMENTARY FRENCH. — As stated under Course 1. Prerequisite, Course 1.
Mr. MACKIMMIE.

3. INTERMEDIATE FRENCH (third year). — Training for rapid reading; the reading of a number of standard novels and plays; composition; reports on collateral reading from periodicals and scientific texts in the library. Required of freshmen who present two years of French for entrance and do not take German, and of sophomores who take Courses 1 and 2 as freshmen; open upon arrangement to other students; 4 hours. Credit, 4.

Mr. MACKIMMIE.

4. INTERMEDIATE FRENCH. — As stated under Course 3, but not required of sophomores who take Courses 1 and 2 as freshmen. Prerequisite, Course 3.

Mr. MACKIMMIE.

5. ADVANCED FRENCH (fourth year). — A reading course; representative masterpieces of the nineteenth century; collateral reading and written reports. Required of sophomores who take Courses 3 and 4 as freshmen; open upon arrangement to other students. Prerequisite, Course 4; 3 hours. Credit, 3.

Mr. MACKIMMIE.

Elective Courses.

6. ADVANCED FRENCH (fourth year). — A general view of the history of French literature. Several plays of the great classical dramatists will be read. Prerequisite, Course 5. Sophomores; open upon arrangement to other students; 3 hours. Credit, 3.

Mr. MACKIMMIE.

7. FRENCH LANGUAGE OR LITERATURE (fourth year). — Courses in more advanced subjects; to be announced; 3 hours. Credit, 3.

Mr. MACKIMMIE.

8. FRENCH LANGUAGE OR LITERATURE. — As outlined under Course 7.

Mr. MACKIMMIE.

SPANISH.

Elective Courses.

1. ELEMENTARY SPANISH. — Grammar, with special drill in pronunciation; reading from a simple reader. Seniors; open upon arrangement to other students; 4 hours. Credit, 4.

Mr. MACKIMMIE.

2. MODERN SPANISH AUTHORS. — Reading from modern Spanish novel and drama. Prerequisite, Course 1. Seniors; open upon arrangement to other students; 4 hours. Credit, 4.

Mr. MACKIMMIE.

GERMAN.

Required Courses.

1. ELEMENTARY GERMAN. — Grammar and composition; the reading of short stories, poems, plays, etc. Especial attention is given to oral questioning and answering in German, and to translation of English into German. Required of those presenting French for entrance who do not continue that language and have not studied German. Freshmen; open upon arrangement to other students; 4 hours. Credit, 4.

Mr. ASHLEY.

2. ELEMENTARY GERMAN. — As stated under Course 1. Prerequisite, Course 1.

Mr. ASHLEY.

3. INTERMEDIATE GERMAN. — Rapid reading of selected works from Schiller, Goethe, Lessing and others; review of grammar and dictation in German; outside readings. Required of freshmen who present German for entrance and do not take French. Freshmen; open upon arrangement to other students; 4 hours. Credit, 4.

Mr. ASHLEY.

3A. INTERMEDIATE GERMAN. — Rapid reading of prose works, such as Sudermann's "Frau Sorge," and dramas, such as "Wilhelm Tell" and "Die Journalisten." Required of sophomores who took Courses 1 and 2 as freshmen.

Mr. ASHLEY.

4. INTERMEDIATE GERMAN. — As stated under Course 3. Prerequisite, Course 3.

Mr. ASHLEY.

4A. INTERMEDIATE GERMAN. — As stated under Course 3A. Open to students who have completed German 3A; 3 hours. Credit, 3.

Mr. ASHLEY.

5. ADVANCED GERMAN. — Literary study of the classicists, — Schiller's "Wallenstein," Lessing's "Nathan der Weise," Goethe's "Iphigenia," etc.; collateral readings in German and class-room reports. Conducted in German. Prerequisite, Course 4. Sophomores; required of those who took German 3 and 4 as freshmen; open upon arrangement to other students; 3 hours. Credit, 3.

Mr. ASHLEY.

Elective Courses.

6. ADVANCED GERMAN. — As stated under Course 5. Sophomores; open upon arrangement to other students. Prerequisite, Course 5; 3 hours. Credit, 3. Mr. ASHLEY.

7. MODERN GERMAN. — Reading of articles from the best modern German periodicals, such as "Ueber Land und Meer;" conversation and composition work based on text. "Ferien in Deutschland," prepared by instructor; 3 hours. Credit, 3. Mr. ASHLEY.

8. MODERN GERMAN. — As stated under Course 7.

Mr. ASHLEY.

*Music.**Elective Courses.*

1. HISTORY AND INTERPRETATION OF MUSIC. — History of music among the ancients; medieval religious and secular music; epoch of vocal counterpoint; development of monophony opera and oratorio; life and works of the greatest representatives of the classical school — Bach, Händel, Haydn, Gluck and Mozart. One hour. Credit, 1. Mr. ASHLEY.

2. HISTORY AND INTERPRETATION OF MUSIC. — A continuation of Course 1. The Romantic school; Beethoven, Schubert, Weber, Mendelssohn, Schumann, Chopin, Berlioz and Liszt; Wagner and the opera. The Modern school and Modern composers. One hour. Credit, 1. Mr. ASHLEY.

*Department of Political Science.**Required Courses.*

1. ECONOMICS. — An introductory course. A study of the nature and scope of economics; the evolution and organization of the present economic system; and the principles of consumption, production, exchange and distribution. Text-books, lectures and essays; required, but may be taken in either the junior or the senior year; 3 hours. Credit, 3. Assistant Professor EYERLY.

Elective Courses.

2. GOVERNMENT. — The organization and working of the various kinds of government in the United States; government problems connected with transportation, taxation and monopolies;

comparison of State leadership in American agriculture with that in European agriculture. Text-books, lectures and assigned reading; 3 hours. Credit, 3. Assistant Professor EYERLY.

3. SOCIOLOGY. — The nature, scope and principles of sociology; social origins and structures; control by custom, religion, education, public opinion, law, etc.; social ideals; practical problems in social progress. Lectures, text-book and assigned readings; 3 hours. Credit, 3. Assistant Professor EYERLY.

4. ECONOMIC HISTORY. — The economic history of England to the reign of Henry VIII.; the history of England and the American colonies in conjunction to 1783; and thereafter the history of England and of the United States. Emphasis is laid on economic history, but the more important political and religious movements are treated in their economic relations. Text-books, lectures and assigned reading; 3 hours. Credit, 3.

Assistant Professor EYERLY.

5. THE HISTORY OF NEW ENGLAND. — In this course, New England is regarded as a unit. Although the history of agriculture and rural life is treated with special fulness, ample attention is given to political, religious and ethical history. It is hoped that the student will not only be led to an intelligent understanding of present economic conditions, but will also be imbued with a progressive loyalty to the highest ideals of the New England of the past. Lectures and required reading; 3 hours. Credit, 3.

Mr. HOLCOMB.

6. PRACTICAL PROBLEMS IN ECONOMICS. — An advanced course following Economics 1. A group of problems will be selected for careful study. Each student will make a special study of one of the following topics: labor, capital, money, banking, insurance, protection and free trade, railways, corporations, and the personal distribution of wealth. Lectures, assigned readings and reports; 3 hours. Credit, 3. Assistant Professor EYERLY.

8. THE HISTORY OF IDEALS. — This course treats history from the idealistic, rather than from the economic, point of view. It attempts to define the great ideals which have impelled some of the most important social, political, esthetic, scientific, ethical and religious movements of medieval and modern history, and to trace the

causes of the success or failure of the movements to which these ideals have led. Christianity, including monasticism, modern Catholicism and Protestantism; medieval art and architecture; the modern scientific movement; and social and political democracy will be treated historically from this point of view. Lectures and reading; 3 hours. Credit, 3. Mr. HOLCOMB.

Department of Mathematics, Physics and Civil Engineering.

Professor OSTRANDER, Associate Professor HASBROUCK, Captain MARTIN,
Mr. DUNCAN.

Required Courses.

1. HIGHER ALGEBRA. — A brief review of radicals, quadratic equations, ratio and proportion, and progressions; binomial theorem, undetermined coefficients, summation of series, continued fractions, logarithms, theory of equations. Wells's "College Algebra." Freshmen; 5 hours a week. Credit, 5.

Associate Professor HASBROUCK, Captain MARTIN
and Mr. DUNCAN.

2. SOLID GEOMETRY. — Theorems and exercises on the properties of straight lines and planes, dihedral and polyhedral angles, prisms, pyramids and regular solids; cylinders, cones and spheres; spherical triangles and the measurement of surfaces and solids. Gore's "Solid Geometry." Freshmen; required unless accepted for admission; 2 hours. Credit, 2. Mr. DUNCAN.

4. PLANE TRIGONOMETRY. — The trigonometric functions as lines and ratios; proofs of the principal formulas, transformations; inverse functions, use of logarithms; the applications to the solution of right and oblique triangles; practical applications. Bowser's "Elements of Plane and Spherical Trigonometry." Required unless accepted for admission. Freshmen; 3 hours. Credit, 3.

Associate Professor HASBROUCK, Captain MARTIN.

5. GENERAL PHYSICS. — Elementary mechanics and heat. Lectures, recitations and laboratory work. Text-book and lectures. Sophomores; 4 hours class-room work and 1 laboratory period. Credit, 5. Adjunct Professor HASBROUCK and Mr. DUNCAN.

Elective Courses.

6. GENERAL PHYSICS. — Electricity and light. Text-book, lectures, recitations and laboratory work. Sophomores; 2 hours of class-room work and 1 laboratory period. Credit, 3.

Adjunct Professor HASBROUCK and Mr. DUNCAN.

[9. ADVANCED PHYSICS. — The senior elective in physics is not offered for the year 1910–11.

Adjunct Professor HASBROUCK.]

8. PLANE SURVEYING. — The elements of the subject, including the adjustment and use of the usual instruments. Text-book and lectures. Sophomores; 6 hours a week. Credit, 3.

Mr. DUNCAN.

7. ANALYTIC GEOMETRY. — A discussion of the geometry of the line, the circle, of conic sections and of the higher plane curves. Fine and Thompson's "Coördinate Geometry." Prerequisites, Mathematics 1, 2 and 4; 3 hours a week. Credit, 3.

Professor OSTRANDER.

10. DIFFERENTIAL AND INTEGRAL CALCULUS. — A first course in the subject, with some of the more important applications. Granville and Smith's "Differential and Integral Calculus." Prerequisites, Mathematics 1, 2, 4 and 7; 5 hours. Credit, 5.

Professor OSTRANDER.

[11. HYDRAULICS AND SANITARY ENGINEERING.¹ — Hydrostatics, theoretical hydraulics, orifices, weirs, pipes, conduits, water supply, hydraulic motors, sewers and sewage treatment. Text-book and lectures; 3 hours. Not given in 1910–11. Credit, 3.

Professor OSTRANDER.]

[12. ADVANCED SURVEYING.¹ — Topographic and higher surveying, highway construction, earthwork, pavements and railroad construction. Text-book and lectures; 6 hours. Not given in 1910–11. Credit, 5.

Professor OSTRANDER.]

13. STRESSES IN STRUCTURES.¹ — An elementary course in roof

¹ Instruction in civil engineering will be given in two distinct courses of one year each, the courses alternating. The courses are open to students of the junior and senior classes.

and bridge stresses. Text-book and lectures; 4 hours. Not given in 1911-12. Credit, 3. Professor OSTRANDER.

14. STRENGTH OF MATERIALS, FOUNDATIONS AND MASONRY CONSTRUCTION.¹ — Text-book and lectures; 6 hours. Not given in 1911-12. Credit, 5. Professor OSTRANDER.

15. ANALYTIC MECHANICS. — A course in theoretical mechanics, based on the calculus, with applications to problems. Text-book and lectures. Prerequisites, Mathematics 7, 10; 3 hours. Credit, 3. Professor OSTRANDER.

Department of Military Science and Tactics.

Captain MARTIN.

[The Department of Military Science and Tactics conducts its work in conjunction with the Department of Physical Education and Hygiene, in accordance with the following statement: —

All candidates for a degree in a four-years course must take for three years three full hours a week of physical training. This work must be under college supervision. At least two years of the work must be taken in the Department of Military Science and Tactics, in accordance with the requirements of the War Department; the rest is to be taken in the Department of Physical Education.

Under this arrangement, the practical (drill) courses in Military Science are given up to the Christmas recess and from the close of the spring recess to the end of the semester each year; the corresponding courses in Physical Education occupy the intervening time.

Under act of Congress (July 2, 1862), military instruction under a regular army officer is required in this college of all able-bodied male students. Men are excused from the exercises of this department only upon presentation of a certificate given by the college physician; minor disabilities which might bar enlistment are not considered. Students excused from military duty may be required to take equivalent work. The object of the instruction is to disseminate military knowledge in order that in emergency trained men may be found to command volunteer troops; but a further object is to give physical exercise, to teach obedience without detracting from self-respect, and to develop the bearing and courtesy that are as becoming in a citizen as in a soldier. Absences and other offences of military nature, and those of which the military instructor may take cognizance as affecting discipline, are dealt with by the commandant in accordance with the regulations of the department; but delinquencies in theoretical instruction not strictly military in their nature are dealt with in accordance with the rules of the faculty.

Cadets in the graduating class who have shown special aptitude for military service are reported to the Adjutant-General of the United States army and to the Adjutant-General of Massachusetts; in making appointments from civil life to the regular or volunteer army, preference is given to those who have been so reported. The names of the three most distinguished are published in the "Official Register of the United States Army." Assignments to the band are made by the military instructor. Practice in the band is credited in place of drill and theoretical instruction.

A dark blue uniform, old army pattern, costing about \$15, is worn by all cadets when on military duty, and may be worn at other times. The uniforms are procured through an authorized tailor. Students upon entering college are required to deposit \$15 with the college treasurer to cover the cost of the uniform. The sale of old uniforms is prohibited, unless the consent of the military instructor be obtained.]

Required Courses.

1. INTRODUCTION TO MILITARY SCIENCE AND TACTICS. — Practical instruction in infantry drill regulations through the school of the battalion in close and extended order; advance and rear guards;

outposts; marches; ceremonies; guard duty. Upon the conduct and proficiency of this year depends the appointment of corporals for the ensuing year. Freshmen; first semester until Christmas recess; 3 hours. Credit, 1. Captain MARTIN.

2. INTRODUCTION TO MILITARY SCIENCE AND TACTICS.—As stated under Course 1. Freshmen; second semester after spring recess; 3 hours. Credit, 1. Captain MARTIN.

3. PRACTICE OF MILITARY SCIENCE AND TACTICS.—Practical instruction as before; pointing, aiming and sighting drills; litter drills, and first aid to the injured by detachment; target practice, in gallery and on the range. Corporals are appointed from this class. On their conduct and proficiency depends the appointment of sergeants in the next class. Sophomores; first semester until Christmas recess; 3 hours. Credit, 1. Captain MARTIN.

4. PRACTICE OF MILITARY SCIENCE AND TACTICS.—As stated under Course 3. Sophomores; second semester after spring recess; 3 hours. Credit, 1. Captain MARTIN.

5. THEORY OF MILITARY SCIENCE AND TACTICS.—Theoretical instruction in "Infantry Drill Regulations," to include the school of the company, "Manual of Guard Duty," "Small Arms Firing Regulations." Sophomores; 1 hour. Credit, 1.

Captain MARTIN.

6. THEORY OF MILITARY SCIENCE AND TACTICS.—As stated under Course 5. Sophomores; 1 hour. Credit, 1.

Captain MARTIN.

7. PRACTICE OF HIGHER MILITARY SCIENCE AND TACTICS.—Practical instruction as before, target practice, in gallery and on the range. Sergeants are appointed from this class. On their conduct and proficiency depends their selection as officers for the ensuing year. When necessary, officers will also be appointed from this class. Juniors; first semester until Christmas recess; 3 hours. Credit, 1.

Captain MARTIN.

8. PRACTICE OF HIGHER MILITARY SCIENCE AND TACTICS.—As stated under Course 7. Juniors; second semester after spring recess; 3 hours. Credit, 1.

Captain MARTIN.

9. THEORY OF HIGHER MILITARY SCIENCE AND TACTICS. — Theoretical instruction in "Infantry Drill Regulations," to include the school of the battalion; advance and rear guards; outposts; marches and ceremonies; "Manual of Field Service Regulations;" preparation of reports, returns, muster-rolls, enlistment and discharge papers, rosters, requisitions, etc.; army regulations; lectures on military science. Juniors; 1 hour. Credit, 1.
Captain MARTIN.

10. THEORY OF HIGHER MILITARY SCIENCE AND TACTICS. — As stated under Course 9. Juniors; 1 hour. Credit, 1.
Captain MARTIN.

Elective Courses.

11. ADVANCED MILITARY SCIENCE AND TACTICS. — Practical instruction as before; conduct of drills of lower classes. Officers will as a rule be selected from this class. Cadets electing Courses 11 and 12 must make the election for the year, and not later than the first Monday in June of their junior year. No cadet electing this course will after the commencement drill be permitted to change his election without the consent of the dean of the faculty and of the commandant. Seniors; first semester until Christmas recess; 3 hours. Credit, 1.
Captain MARTIN.

12. ADVANCED MILITARY SCIENCE AND TACTICS. — As stated under Course 11. Seniors; second semester after spring recess; 3 hours. Credit, 1.
Captain MARTIN.

Department of Physical Education and Hygiene.

Assistant Professor REYNOLDS.

HYGIENE.

Required Courses.

1. HYGIENE. — Lectures, reading, quizzes and a report on some assigned topic of personal hygiene or sanitation. Freshmen; 1 hour. Credit, 1.
Assistant Professor REYNOLDS.

PHYSICAL EDUCATION.

[The Department of Physical Education conducts its work in physical training in conjunction with the Department of Military Science and Tactics, as explained in the note preceding the description of the courses in Military Science. All classified undergraduate students are given a physical examination upon entering.]

Required Courses.

1. ELEMENTARY GYMNASTICS. — Exercises, games and athletics; from January 1 to April 1, in connection with Course 2. Freshmen; 3 hours. Credit, 1.
Assistant Professor REYNOLDS.

2. ELEMENTARY GYMNASTICS. — As stated under Course 1.

Assistant Professor REYNOLDS.

3. GRADED GYMNASTICS. — Exercises, games and athletics; from January 1 to April 1, in connection with Course 4. Sophomores; 3 hours. Credit, 1.

Assistant Professor REYNOLDS.

4. GRADED GYMNASTICS. — As stated under Course 3.

Assistant Professor REYNOLDS.

5. HEAVY GYMNASTICS. — Drills, games and athletics; from January 1 to April 1, in connection with Course 6. Juniors; 3 hours. Credit, 1.

Assistant Professor REYNOLDS.

6. HEAVY GYMNASTICS. — As stated under Course 5.

Assistant Professor REYNOLDS.

Elective Courses.

7. TRAINING COURSE. — Leadership class and squad work; supervision of indoor and outdoor athletic contests and games; boxing and wrestling. Seniors; 3 hours. Credit, 1.

Assistant Professor REYNOLDS.

8. TRAINING COURSE. — As stated under Course 7.

Assistant Professor REYNOLDS.

9. ADVANCED GYMNASTICS. — For those who wish to become candidates for the gymnastic team. Credit, 0.

Assistant Professor REYNOLDS.

10. ADVANCED GYMNASTICS. — As stated under Course 9.

Assistant Professor REYNOLDS.

Department of Rural Social Science.

President BUTTERFIELD, Assistant Professor EYERLY, Assistant Professor CANCE.

AGRICULTURAL ECONOMICS.

Required Courses.

2. AGRICULTURAL INDUSTRY AND RESOURCES. — A descriptive course dealing with agriculture as an industry and its relation to physiography, movement of population, supply of labor, commercial development, transportation, public authority and consumers'

demand. The principal agricultural resources of the United States will be studied with reference to commercial importance, geographical distribution, present condition and means of increasing the value of the product and cheapening cost of production. Lectures, assigned readings, class topics and discussions. Sophomores; 3 hours. Credit, 3. Assistant Professor CANCE.

Elective Courses.

4. ELEMENTS OF AGRICULTURAL ECONOMICS. — This course is designed to follow the required work in the elements of economics. It will consider the economic principles underlying the welfare and prosperity of the farmer and those institutions upon which his economic success depends; the economic elements in the production and distribution of agricultural wealth; means of exchange; the agricultural market; determination of price; speculation; problems of land tenure and land values; business co-operation; farmers' organizations; the farmer and legislation; the maintenance of the social, political and economic status of the farmer; and the relation of the farmer to the State. Lectures, text, readings, topics and field work; 3 hours. Credit, 3.

Assistant Professor CANCE.

5. HISTORICAL AND COMPARATIVE AGRICULTURE. — A general survey of agriculture, ancient and modern; feudal and early English husbandry; the later development of English agriculture; the course of agriculture in the United States, with special emphasis on present conditions and the history of agriculture in New England. An attempt will be made to measure the influence of times, peoples and countries in producing different systems of agriculture, to show that the agriculture of any country is a distinct individual problem, and to ascertain the causes now working to effect agricultural changes. Lectures, readings and library work. Seniors; open to other students upon arrangement; prerequisite, Course 4 or equivalent; 3 hours. Credit, 3. Assistant Professor CANCE.

6. CO-OPERATION IN AGRICULTURE. — The course contemplates a somewhat comprehensive view of the history, principles and social relations of agricultural organization for profit. Part I., The business aspects of co-operation: (1) A survey of the development and progress, the methods and economic results, of the farmers' organizations and great co-operative movements in the past; (2) the phases of business organization of agriculture abroad, and the

present aspects and tendencies in the United States; (3) the principles underlying successful co-operative endeavor among farmers, and practical working plans for co-operative associations, as illustrated by the most advanced and prosperous business organizations and exchanges, with particular reference to the marketing of perishable products. Part II., Social aspects of co-operation: The second part of this course treats of the social conditions necessary to successful co-operation; the effect of co-operation on character, *e.g.*, on individualism, conservatism; the relation of co-operation to political achievement, especially as illustrated in European countries; the influence of co-operation in begetting a community consciousness; and the effect of organization on class status. Lectures, assigned reading and practical exercises; 3 hours. Credit, 3.

Assistant Professor CANCE (Part I.)

Assistant Professor EYERLY (Part II.).

7. SPECIFIC PROBLEMS IN AGRICULTURAL ECONOMICS.—An advanced course for students desirous of studying more intensively some of the problems immediately affecting the welfare of the farmer and society. Some of the problems that may be studied are: land problems; land tenure; size of farms; causes affecting land values; private property in land; taxation and inheritance; special problems; marketing and manufacturing farm products; cost of production; farm labor in New England; immigration; shifting of the rural population. Opportunity will be given, if practicable, for field work, and students will be encouraged to pursue lines of individual interest. Seniors; open upon arrangement to other students; enrollment subject to approval of instructor; 2 hours a week. Credit, 2.

Assistant Professor CANCE.

9. SEMINAR.—Research in agriculture: New England agriculture to 1860. Library work and reports. If desirable some other topic may be substituted. Hours to be arranged. Credit, 1.

Assistant Professor CANCE.

10. SEMINAR.—As stated in Course 9.

Assistant Professor CANCE.

RURAL SOCIOLOGY.

Elective Courses.

12. THE RURAL COMMUNITY. — There are two general divisions of the subject. There is, first, a study of the social status of the rural population, including the significance of the movement to the cities, the present social conditions of farm people, the social effects of rural life, and the social aspect of various agricultural questions of a technical or economic character. In the second part of the study will be discussed the various social agencies in rural progress, such as means of communication, farmers' organizations, rural schools, means of agricultural education, rural religious institutions and the federation of rural social agencies. Lectures, readings and essays on assigned topics; 3 hours. Credit, 3.

President BUTTERFIELD and Assistant Professor EYERLY.

16. RURAL LITERATURE. — A critical and appreciative study of writers, both in prose and poetry, who have interpreted Nature from the viewpoint of the lover of country life, and those who have idealized agriculture, horticulture and other rural pursuits, together with those who have upheld as an ideal the development of a rural environment in cities; 3 hours. Credit, 3.

Mr. HOLCOMB.

Department of Veterinary Science.

Professor PAIGE.

[The courses in veterinary science have been arranged to meet the needs of students who purpose following practical agriculture, and of prospective students of human and comparative medicine.]

Elective Courses.

1. INTRODUCTORY BACTERIOLOGY. — The object of this course is to acquaint the student with the various organisms found in air, water, soil, milk and the body, and with the relation of these organisms to such processes as decomposition, fermentation and digestion, and to the production of disease. Toxic substances resulting from the growth of organisms, and the antitoxins used to counteract their action, are considered. Lectures, recitations and laboratory work. Seniors; 3 two-hour laboratory exercises. Credit, 3.

Professor PAIGE.

3. VETERINARY SCIENCE. — A course treating of veterinary hygiene, comparative anatomy and general pathology; veterinary materia medica and therapeutics; the theory and practice of

veterinary medicine; general, special and operative surgery; and veterinary bacteriology and parasitology. Lectures, clinics, demonstrations and laboratory exercises. Must be followed by Course 4. Seniors; 5 hours. Credit, 5. Professor PAIGE.

4. VETERINARY SCIENCE. — As stated under Course 3.

Professor PAIGE.

Department of Zoölogy and Geology.

Assistant Professor GORDON.

ZoöLOGY.

Required Courses.

1. ELEMENTARY ZoöLOGY. — This course in a general way constitutes the zoölogical part of an introductory course in biology. Laboratory dissection and lectures; laboratory text, Drew's "Invertebrate Zoölogy." Sophomores; 2 two-hour laboratory periods and 1 lecture hour. Credit, 3. Assistant Professor GORDON.

Elective Courses.

3. INVERTEBRATE ZoöLOGY. — This course does not include the insects. Economic zoölogy. Text-books, Parker & Haswell's "Textbook of Zoölogy," Vol. I., and Drew's "Invertebrate Zoölogy." Prerequisite, Course 1 or its equivalent. Must be followed by Course 4. Juniors; 2 two-hour laboratory periods and 1 lecture hour. Credit, 3. Assistant Professor GORDON.

4. VERTEBRATE ZoöLOGY. — Text-book, Parker & Haswell's "Textbook of Zoölogy," Vol. II. Prerequisite, Course 3. Juniors; 2 two-hour laboratory periods and 1 lecture hour. Credit, 3.

Assistant Professor GORDON.

5. ANIMAL PARASITES. — A survey of this special field of zoölogy. Laboratory and lecture work, with outside reading. Laboratory technique. Seniors; not open to fewer than 3 students. Prerequisites, Courses 1, 3 and 4. Three two-hour periods, 2 one-hour periods. Credit, 5. Assistant Professor GORDON.

6. ANIMAL PARASITES. — A continuation of Course 5. Two two-hour periods, 1 one-hour period. Credit, 3.

7, 8 and 9. ADVANCED ZoöLOGY. — See "Graduate School."

Assistant Professor GORDON.

GEOLOGY.

Elective Courses.

2. GENERAL GEOLOGY. — Rock-forming minerals; rock types; dynamical, structural and surface geology. Lectures, map and field work. Sophomores; 1 two-hour laboratory period and 2 lecture periods. Credit, 3.

Assistant Professor GORDON.

THE GRADUATE SCHOOL.

THE GRADUATE SCHOOL.

KENYON L. BUTTERFIELD, A.M., LL.D., President of the College.

HENRY T. FERNALD, Ph.D., Acting Director of the Graduate School and Professor of Entomology.

Graduate courses leading to the degrees of master of science and doctor of philosophy have been given for a number of years. Demands for these courses have now greatly increased, and in recognition of the benefits to be derived from a separate organization, a distinct graduate school has been established for the purpose of fitting graduates of this and other institutions for teaching in colleges, high schools and other public schools; for positions as government, State and experiment-station agriculturists, bacteriologists, botanists, chemists, entomologists, horticulturists and zoölogists; and for numerous other positions requiring a great degree of skill and scientific knowledge.

ADMISSION.

Admission to the graduate school will be granted:—

1. To graduates of the Massachusetts Agricultural College.
2. To graduates of other institutions of good standing who have received a bachelor's degree substantially equivalent to that conferred by this college.

In case an applicant presents his diploma from an institution of good standing, but has not, as an undergraduate, taken as much of the subject he selects for his major as is required of undergraduates at the Massachusetts Agricultural College, he will be required to make up such parts of the undergraduate work in that subject as the professor in charge may consider necessary. He shall do this without credit toward his advanced degree.

Admission to the graduate school does not necessarily admit to candidacy for an advanced degree,—students holding a bachelor's degree being in some cases permitted to take graduate work without becoming candidates for higher degrees.

Applications for admission to the graduate school should be presented to the director of the school. Full statements of the applicant's previous training, of the graduate work desired, and

of the amount and kind of work already done by him as an undergraduate should be submitted, — together with a statement whether the applicant desires to work for a degree.

Registration is required of all students taking graduate courses, the first registration being permitted only after the student has received an authorization card from the director.

NATURE AND METHODS OF GRADUATE WORK.

Persons taking graduate work will find this quite different in its nature from undergraduate courses. A broad knowledge of two (or three) subjects is required, and the professors in charge of these may adopt any methods which may seem desirable to secure this to the student. Lectures, laboratory and field work in various forms are utilized; but whatever the method chosen, the aim is to train the students in methods of original investigation and experiment, inductive reasoning and the ability to carry on independent research. In addition to the lectures, a large amount of outside reading is required, the object being to give a broad knowledge of all aspects of the subjects chosen, in addition to the complete knowledge of those portions involved in or directly related to the original investigation which is to result in the thesis. Originality and ability to lead in scientific research after completing graduate work, and the establishment of a broad and thorough foundation upon which these qualities must be based, are the objects aimed at; and any methods which promise to give these results may be made use of (varying according to the nature and personal equation of each student), the supervision being largely individual rather than collective.

Candidates for the degree of master of science are required to prosecute two subjects, one of which shall be designated as the major and the other as the minor. These subjects may not be selected in the same department.

Candidates for the degree of doctor of philosophy are required to prosecute three subjects, one of which shall be designated as the major, the others as minors. No two of these subjects may be taken in the same department.

Advanced students who are not candidates for degrees may, with the approval of the faculty of the school, take more than one subject in the same department.

A statement of the subjects chosen must in each case be submitted to the director of the school for approval by the necessary committee. The chosen subjects must bear an appropriate relation to each other.

A working knowledge of French and German is essential to successful graduate work, and students not having this will find it necessary to acquire it as soon as possible after entering.

A description of the equipment of the various departments is given under "General Information."

THESES.

A thesis is required of each candidate for an advanced degree. It must be on a topic belonging to the candidate's major subject, must show that its writer possesses the ability to carry on original research, and must be an actual contribution to knowledge.

The thesis in its final form, ready for the printer, must be submitted to the director of the school for examination by the committee on the graduate school before the candidate for the degree may take the required oral examination. The candidate for the doctor's degree must be prepared to defend at the oral examination the views presented in the thesis.

All theses become the property of the department in which they are prepared. When they are printed, five copies of each thesis must be deposited with the department.

FINAL EXAMINATIONS.

For the degree of master of science, a final examination, which may be either written or oral, or both, is given upon the completion of each subject.

For the degree of doctor of philosophy, final examinations on the minors taken are given upon the completion of the subjects. In the major subject, a written examination, if successfully passed, is followed by an oral examination in the presence of the faculty of the school.

DEGREES CONFERRED.

The degree of master of science is conferred upon graduate students who have met the following requirements:—

1. The devotion of at least one year and a half to the prosecution of study in two subjects of study and research, not less than one full college year of which must be in residence.

2. The devotion of twenty hours each week to the chief or major subject, and of from twelve to sixteen hours per week to the minor subject.

3. The preparation of a thesis in the major subject, constituting an actual contribution to knowledge, and accompanied by drawings if necessary.

4. The passing of final examinations, in both major and minor subjects, to the satisfaction of the professors in charge.

5. The payment of all fees and college expenses required.

The degree of doctor of philosophy is conferred upon graduate students who have met the following requirements:—

1. The devotion of at least three years to the prosecution of three subjects of study and research in residence at the college.

2. The devotion of twenty hours each week to the chief or major subject during the entire period, and of from twelve to sixteen hours per week for a year and a half to each minor subject.

3. The preparation of a thesis, in the major subject, constituting an actual contribution to knowledge, and accompanied by drawings if necessary.

4. The passing of final examinations, in both the major and minor subjects, to the satisfaction of the professors in charge.

5. The payment of all fees and college expenses required.

The fee for the degree of master of science is \$10, and for the degree of doctor of philosophy, \$25.

COURSES FOR DEGREE OF MASTER OF SCIENCE.

Available either as major or minor subjects for the degree of master of science:—

Agriculture.

Botany.

Chemistry.

Entomology.

Horticulture.

Mathematics and physics.

Veterinary science.

COURSES FOR THE DEGREE OF DOCTOR OF PHILOSOPHY.

Available for a major subject for the degree of doctor of philosophy:—

Botany.

Chemistry.

Entomology.

Horticulture.

Available for a minor subject for the degree of doctor of philosophy:—

Agriculture.

Botany.

Chemistry.

Entomology.

Horticulture.

Zoölogy.

GENERAL OUTLINE OF COURSES FOR THE DOCTORATE.

(a) Major Courses.

BOTANY. — The following subjects in botany may be studied: —

- (a) Vegetable physiology.
- (b) Vegetable pathology.
- (c) Mycology.
- (d) Ecology.
- (e) Taxonomy.
- (f) Phylogeny.
- (g) History of botany.
- (h) History and theory of evolution.

These subjects are pursued, to a greater or less extent, as the previous training of the student and the nature of the original problem undertaken may determine. The object of the course is to give the student a technical training in botany, to develop the spirit of research and to lay a broad foundation in the subject. (As a supplement to this course the student will do well to take, in addition to his prescribed minor work, a brief course in the history of philosophy and psychology.) Extensive reading of botanical literature, both general and specific, is required in certain subjects, and occasional lectures are given. A botanical conference is held monthly, in which various new problems of botanical science are considered by graduate students and the seniors who elect botany. A thesis dealing with some economic problem in plant physiology or pathology, or in both, and containing a distinct contribution to knowledge, is required.

CHEMISTRY. — The following subjects in chemistry may be studied: —

- (a) Inorganic analysis, qualitative (of the rarer elements) and quantitative.
- (b) Crystallography.
- (c) Physical chemistry.
- (d) Descriptive and determinative mineralogy.
- (e) Chemical geology.
- (f) Soil formation.
- (g) Soil physics and chemistry; gas analysis; synthetic inorganic work.
- (h) Chemical theory and history.
- (i) General organic chemistry.
- (j) Special topics in organic chemistry.

- (k) Elementary quantitative organic analysis.
- (l) Proximate qualitative and quantitative organic analysis, including determination of organic radicles.
- (m) Organic synthesis of aliphatic and aromatic compounds.
- (n) Problems in chemical manufacture.
- (o) Recent chemistry of plant nutrition.
- (p) Animal physiological and pathological chemistry, including the chemistry of foods, of milk and milk industries, of urine, urinalysis, and the standards for feeding of all kinds.
- (q) Toxicology.
- (r) Insecticides and fungicides.

Frequent examinations on current chemical literature are given. Early in the course original work on some chemical subject pertaining to agriculture must be begun. The history and results of this work must, before the awarding of the degree, be submitted in the form of a thesis containing a distinct contribution to knowledge.

ENTOMOLOGY. — I. For the degree of doctor of philosophy as a major: Some knowledge of all the divisions of this subject is essential for the professional entomologist, though a large part of his time will be devoted only to certain portions. To insure some familiarity with all these divisions, lectures, laboratory work, field training or required reading are given in each of the following topics: —

(a) *Morphology*. — Embryology; life history and transformations; histology; phylogeny and the relation of insects to other arthropods; hermaphroditism; hybrids; parthenogenesis; pedogenesis, heterogamy; chemistry of colors of insects; luminosity; deformities of insects; variation; duration of life.

(b) *Ecology*. — Dimorphism; polymorphism; warning coloration; mimicry; insect architecture; fertilization of plants by insects; instincts of insects; insect products of value to man; geographical distribution in the different faunal regions; methods of distribution; insect migration; geological history of insects; insects as disseminators of disease; enemies of insects, vegetable and animal, including parasites.

(c) *Economic Entomology*. — General principles; insecticides; apparatus; special cases; photographs of insects and their work; methods of drawing for illustrations; field work on insects and study of life histories; legislation concerning insects.

(d) *Systematic Entomology*. — History of entomology, includ-

ing classifications and the principles of classification; laws governing nomenclature; literature, how to find and use it; indexing literature; number of insects in collections and in existence (estimated); lives of prominent entomologists; methods of collecting, preparing, preserving and shipping insects; important collections of insects.

(e) *Seminar*.—A monthly meeting of graduates, at which reports on current literature are presented and various entomological topics of importance are discussed.

(f) *Required Readings*.—The best articles on the various topics named above and on the different orders of insects, to cover from fifteen thousand to twenty thousand pages of English, French and German, the candidate to be examined at the close of his course on this with his other work.

(g) *Thesis*.—A thesis, illustrated with drawings, consisting of the results of original investigation upon one or several topics, and constituting a distinct contribution to knowledge, must be completed before the final examinations are taken.

II. For the degree of doctor of philosophy as a minor, and for the degree of master of science either as a major or minor: Such portions of the course outlined above as seem most appropriate to their other subjects are given to students taking entomology as a minor.

HORTICULTURE.—The work in horticulture necessarily varies considerably with different candidates, since its most important features are specialization, original investigation and the development of individual initiative in dealing with new questions. Each candidate must select some special field of horticultural study, and devote himself to it continuously. He will be required to attend lectures, conferences and seminars dealing with horticulture in its broader aspects, and to do advanced work in the following subjects:—

(a) Systematic pomology.

(b) Pomological practice.

(c) Commercial pomology.

(d) Systematic, practical and commercial olericulture.

(e) Greenhouse plants and problems.

(f) Floriculture.

(g) Landscape gardening.

(h) Plant breeding and general evolution.

(i) Questions of physiology connected with propagation and pruning.

Other requirements and opportunities are (1) periodical seminars, with special lectures by prominent men from outside the college; (2) extensive and systematically planned readings; (3) frequent visits, always with definite purpose, to orchards, gardens, greenhouses, estates and libraries outside the college grounds; and (4) the preparation and publication of a thesis which shall set forth the results of the candidate's major study, and be an original and positive contribution to horticultural knowledge.

(b) *Minor Courses.*

ZOOLOGY. — The courses in zoölogy are offered as a minor course to candidates for the degree of doctor of philosophy. They constitute an intensive course designed to give a broad outlook and to meet the needs of the specialist, and call for original investigation, laboratory dissection, technique and museum work. The subjects treated and the work done will vary according to circumstances, but may be outlined thus: —

(a) General and comparative anatomy, both gross and microscopic; ontogeny and phylogeny; life cycles, metamorphosis and metagenesis; animal associations, colonial, commensal and parasitic, and symbiotic associations of animals and plants; adaptation, adaptive radiation and parallelisms.

(b) Geologic, geographic and bathymetric distribution of animals.

(c) Systematic zoölogy, including paleozoölogy; museum and field technique.

(d) Economic zoölogy.

(e) History and development of zoölogical science.

(f) Weekly seminar and journal club meetings, in which all advanced students of zoölogy take an active part.

(g) Collateral reading; general knowledge of current zoölogical literature.

OTHER SUBJECTS. — Courses in the other subjects open to choice as minors will be outlined according to the qualification and needs of the students applying for them.

EXTENSION WORK.

EXTENSION WORK.

The extension work of the college includes the short courses and the outside activities, such as correspondence courses, lecture courses and itinerant instruction of various forms away from the college.

SHORT COURSES.

- A. Organization, Expenses and Admission.
- B. The Winter School.
- C. The Summer School.
- D. Itinerant Instruction.

A. ORGANIZATION, EXPENSES AND ADMISSION.

ORGANIZATION. — The work of the short courses in the college was organized in September, 1909, with a director in charge.

The object of the short course work is three fold:—

(1) To bring to the college for instruction for a few days or a few weeks as many people as can possibly be reached in this way.

(2) To disseminate, by various methods, agricultural information to people who cannot come to the college even for a short time.

(3) To make the college as useful as possible to all the people of the Commonwealth who are interested in agriculture and country life.

The work has been organized thus:—

1. The Winter School.

Ten weeks' general course.

Poultry course.

Farmers' week.

Beekeepers' course.

2. The Summer School.

Courses in practical agriculture and horticulture.

Courses in elementary sciences bearing on agriculture and horticulture.

Home economics.

Courses in agricultural education.

- Courses in agricultural economics and rural sociology.
- Courses especially for clergymen and rural social workers.
- Conferences for clergymen, school superintendents, librarians and others.
- Evening lectures by eminent educators.
- Excursions to various points of interest in the vicinity.

3. *Itinerant Instruction.*

- Correspondence courses.
- Lecture courses.
- Practical field demonstrations.
- Travelling schools.
- Educational trains (steam and trolley).
- Educational exhibits at fairs.
- Demonstration orchards.
- Demonstration field experiments.
- Services of expert agricultural authorities.
- Agricultural surveys.
- Advisory work with schools, State institutions and individuals.
- Student extension work.

EXPENSES IN THE SHORT COURSES. — The expenses of attending either of the short courses will be about as follows:—

Tuition to citizens of the United States, ...	Free.
Furnished rooms with private families, per week, ...	\$1-\$3
Board at college dining hall, per week, ...	\$4
Board with private families, per week, ...	\$4-\$5

Students in either of the dairy courses must provide themselves with two white wash suits and a white cap for use in the practical dairy work; the cost in Amherst is about \$1.25 for suit and cap.

REQUIREMENTS FOR ADMISSION TO SHORT COURSES. — No entrance examinations are required, but students are advised to review their school work in English and arithmetic before entering. Practical experience in farm, garden, orchard or greenhouse work will be an advantage. The courses are open to both men and women. Students must be at least eighteen years of age, and must furnish satisfactory evidence of good moral character.

Application for admission should be made as early as possible. Students should report to the professor in charge on Monday, Jan. 2, 1911, in order to begin work promptly on the morning of January 3.

B. THE WINTER SCHOOL.

1. The Ten Weeks' Course.
2. The Short Course in Poultry Management.
3. Farmers' Week.
4. Beekeepers' Course.

1. THE TEN WEEKS' GENERAL COURSE.

JAN. 3—MARCH 10, 1911.

AGRICULTURE, DAIRYING, FRUIT GROWING, FLORICULTURE, MARKET GARDEN-
ING, VETERINARY SCIENCE, ETC.

- a. Courses of Instruction.
- b. Other Information.

a. Courses of Instruction.

1. Soil fertility. Prof. WM. D. HURD. Three exercises a week for eight weeks.
2. Market gardening. Mr. C. S. HELLER. Three exercises each week for ten weeks.
3. Fruit growing. Prof. F. C. SEARS. Five exercises each week for ten weeks.
4. Floriculture. Prof. E. A. WHITE. Five exercises each week.
5. Field crops. Prof. S. B. HASKELL. Three exercises each week for ten weeks.
6. Breeds and breeding. Prof. J. A. McLEAN. Three exercises weekly, with appointed hours for stock judging.
7. Feeding and management. Prof. J. A. McLEAN. Two exercises weekly.
8. Animal diseases and stable sanitation. Dr. J. B. PAIGE. Two exercises each week.
9. Dairying. Prof. W. P. B. LOCKWOOD and assistants. Three one-hour, 2 two-hour and 2 three-hour periods.
10. Dairy bacteriology. Prof. W. P. B. LOCKWOOD. Two exercises each week.
11. Botany. Prof. A. V. OSMUN and others. Three exercises each week.
12. Entomology. Dr. H. T. FERNALD and assistants. Three exercises each week.
13. Mechanics. Prof. W. P. B. LOCKWOOD and Mr. WALLACE. One exercise of two hours each week.
14. Farm accounts. Prof. J. A. FOORD. One exercise each week.
15. Farm buildings and machinery. Prof. J. A. FOORD and Mr. E. H. FORRISTALL. One exercise a week for ten weeks.
16. Landscape gardening. Mr. JOHN NOYES. Twenty exercises.
17. The farmer and the community. Two periods a week.
The development of the rural community, President BUTTERFIELD.
Farm labor, immigration and farmers' organizations, Dr. CANCE.
The government in rural communities, Professor EYERLY.
The educational problems of rural communities, Professor HART.
Agricultural literature, Professor HOLCOMB.

18. Forestry. Prof. F. F. MOON. Six lectures.
19. Meat, meat production and marketing on the farm. Mr. H. P. HINKLEY of Armour & Co. One demonstration each fortnight.

b. Other Information.

ASSEMBLY. — All students of the college are required to attend a weekly assembly, at which an address of general interest is usually given. Attendance at morning chapel service, four times each week, is also required.

2. POULTRY COURSE.

FEBRUARY 27 TO MARCH 10, 1911.

The purpose of this course is to give information to people interested in the poultry business.

Some of the best authorities on the subject of poultry breeding and management in this country have been secured to give the lectures and practical demonstrations.

An effort will be made to make the course a "practical" one, touching the vital problems of the poultry business.

Classes begin Monday, February 27, at 2 P.M.

Instruction will be given by specialists in poultry management, as follows: —

Prof. J. C. GRAHAM, Professor of Poultry Husbandry.

Mr. JOHN H. ROBINSON, Boston, Mass., editor of "Farm Poultry," author, and recognized authority on poultry subjects.

Prof. JAMES E. RICE, Professor of Poultry Husbandry, Cornell University, Ithaca, N. Y.

Mr. EDWIN F. GASKILL, in charge of poultry experiments at Massachusetts Experiment Station, Amherst, Mass.

Mr. D. J. LAMBERT, in charge of poultry work at Rhode Island State College, Kingston, R. I.

Mr. HENRY D. SMITH, Rockland, Mass.

Besides the poultry specialists mentioned above, the following members of the faculty of the Massachusetts Agricultural College will also give instruction in the poultry course: —

Prof. WILLIAM D. HURD, Director of Extension Work.

Dr. JAMES B. PAIGE, Professor of Veterinary Science.

Prof. FRED C. SEARS, Professor of Pomology.

Mr. C. S. HELLER, Instructor in Vegetable Gardening.

J. A. MCLEAN, Professor of Animal Husbandry.

Mr. CLARENCE A. JEWETT, Superintendent of Buildings.

Special Evening Lectures and Other Features.

Throughout the course evening lectures of a popular nature will be given.

The poultry course occurs during the last two weeks of the ten weeks' short winter course, so that those who attend the poultry course may take advantage of the lectures offered in this course as well.

Farmers' week occurs at the college the week following the close of the poultry course. Every one should plan to remain over for this.

Trips will be made to nearby commercial poultry plants to study methods, etc.

Poultry Show.

On March 8, 9 and 10, in connection with the work of the short poultry course, a poultry show will be held. This will be organized along the lines of any well-conducted show, the idea being to give the students training in preparing birds for exhibition and in showing them.

Send for entry blanks.

3. FARMERS' WEEK.

MARCH 13-17, 1911.

The work given in the 1910 farmers' week was as follows. A broader and more complete program will be carried out the present year.

Purpose and Organization of Farmers' Week.

Farmers' week is given by the Massachusetts Agricultural College for the benefit of those who cannot leave their homes or business for a sufficient length of time to take the other short courses.

Farmers' week is divided into sections, so that all who attend may find work of interest to them in progress each day.

1. General agricultural section, — including animal husbandry, dairying and poultry raising. Features of this section are "corn day," with a big corn show, and "dairy day," with exhibits of dairy machinery and dairy products.

2. General horticultural section, — including fruit growing, market gardening, floriculture and forestry. A feature of this section is "apple day."

3. Women's section,—home economics, domestic science and home making.

Eminent people are secured for the evening meetings. One day is given up to a discussion of problems of "community building."

4. BEEKEEPERS' COURSE.

MAY 24—JUNE 7, 1911.

Announcement.¹

Throughout the year the Massachusetts Agricultural College has been receiving calls for a course in beekeeping. To meet the demand, a short course, covering the lines indicated, has been arranged.

During the past year the college has come into possession of about twenty colonies of bees and some other equipment. These, together with the swarms owned by the college faculty, will give most excellent equipment.

The work as laid out is of the most practical nature, and every attempt will be made to emphasize the points which are of the most value, yet are little understood by those engaged in this industry.

The following experts in beekeeping have given the work:—

Courses and Faculty.

1. Practical phases of beekeeping. Dr. BURTON N. GATES.
2. Crops for honey bees. Dr. WM. P. BROOKS.
3. The relation of bees to the pollination of plants. Dr. GEORGE E. STONE.
4. The origin and evolution of the honey bee. Dr. HENRY T. FERNALD.
5. Bees and beekeepers' supplies. Dr. JAMES B. PAIGE.

C. THE SUMMER SCHOOL.²

JULY 3—AUG. 4, 1911.

1. Announcement, Purpose, Plan.
2. Faculty.
3. Election of Courses.
4. Conference for Rural Social Workers.

1. Announcement and General Plans.

The summer school of agriculture and country life at the Massachusetts Agricultural College opened July 11, 1910, for a term of nearly five weeks, closing August 12. This was the fourth

¹ 1910 course; 1911 course not yet ready.

² Description here given is for the 1910 school.

session of this summer school, those of the past three years having been highly successful. The experience of these three years aided in making material improvements for the session of 1910.

The work of the summer school was designed originally for school teachers, and the attendance has been largely of that class. Special attention will be given to the needs of teachers again this year. It has been found, however, that there are many persons who seek a general knowledge of theoretical and practical agriculture, and who can come to the college conveniently during the summer season. Extended courses will be offered for the benefit of such persons also.

From the courses it will be possible to make up programs of work suitable to the needs of almost every one, but especially to school teachers, principals, superintendents, school committeemen, farm owners, householders, suburban residents, clergymen, pastors, preachers, social workers, and those who have only a general interest in agriculture. Persons who are in doubt as to what courses will best suit their needs would better correspond with the director of the summer school, who will gladly advise in all such matters.

The formal instruction in the summer school was given in thirty definite courses, herein described. From these each pupil might elect courses providing not less than ten nor more than fifteen exercises a week, unless a larger or smaller amount of work be allowed by the director. These courses included a large amount of field work, observation trips, outdoor exercises and laboratory experiments.

Besides these, general field exercises will be arranged for one afternoon of each week. These will be on topics of interest to all. Class excursions will be arranged for every Wednesday afternoon, and more extended excursions for the whole school will be planned for every Saturday. These excursions will be in charge of an instructor as heretofore. In the past they have proved a very enjoyable feature of the work.

Round tables and special discussions will be arranged by various instructors as their courses require. A conference of rural social workers and educators of New England was held August 9, 10, 11 and 12. An outline of the conference will be found in another part of this bulletin.

A course of evening lectures on popular topics relating to the work of the school was a feature of the general program. Like everything else connected with the summer school this lecture course is entirely free to all students.

2. Faculty.

1. Soils and tillage. Assistant Prof. S. B. HASKELL. Five exercises weekly the first two weeks. Should be followed by Course 2.
2. Field crops. Assistant Prof. S. B. HASKELL. Five exercises each week for second two weeks. Should be preceded by Course 1.
3. Fruit growing. Prof. F. C. SEARS. Limited to 30 pupils. Five exercises weekly for four weeks.
4. Practical gardening. Mr. C. S. HELLER. Course limited to 20 pupils. Five exercises weekly, two hours each, first four weeks.
5. The study of landscape. Prof. E. A. WHITE. Five exercises weekly, first two weeks.
6. Trees and shrubs. Prof. E. A. WHITE. Five exercises weekly, second two weeks of the term. This course is especially suited to follow Course 5 and to precede Course 7.
7. Forestry. Prof. E. A. WHITE. Lectures and field exercises, five exercises weekly.
8. Domestic animals. Mr. R. L. GRIBBEN. Five hours a week, first four weeks.
9. Modern dairying. Associate Prof. W. P. B. LOCKWOOD. Five exercises weekly for four weeks.
10. School gardening. Prof. W. R. HART. Five exercises a week, first two weeks.
11. Agricultural pedagogy. Prof. W. R. HART. Five exercises weekly, beginning July 25.
12. School agriculture. Assistant Prof. F. B. JENKS. Five exercises weekly for four weeks.
13. Elementary chemistry. Associate Prof. J. CHAMBERLAIN and Assistant Prof. F. S. HOWARD. Five exercises weekly for four weeks.
14. Agricultural high school chemistry. Associate Prof. J. CHAMBERLAIN and Assistant Prof. F. S. HOWARD. Five hours a week, four weeks.
15. Plant experiments. Prof. G. E. STONE. Five exercises weekly for two weeks.
16. Plant life. Assistant Prof. A. V. OSMUN. Five lectures weekly for two weeks, beginning July 25.
17. Cryptogamic botany. Assistant Prof. A. V. OSMUN. Two three-hour exercises weekly for two weeks.
18. Bird life. Mr. C. J. MAYNARD. Five exercises weekly, first two weeks.
19. Insect life. Mr. R. MATHESON. Three class and two laboratory periods for four weeks.
20. Entomology. Mr. R. MATHESON. Three lectures and two laboratory periods for four weeks.
21. Domestic science for rural school teachers. Miss H. RINAKEK. Three lectures and two cooking demonstrations weekly for four weeks.
22. Domestic science and home economics. Miss H. RINAKEK. Three lectures and two demonstrations weekly for four weeks.
23. Household science. Miss H. RINAKEK. Three lectures and two demonstrations of cooking weekly, beginning July 25.
24. New England agriculture. Prof. W. D. HURD. Five exercises weekly.

25. Agricultural economics. Assistant Prof. A. E. CANCE. Five lectures weekly.
26. Development of the rural community. President K. L. BUTTERFIELD. Lasts two weeks.
27. The church and the rural problem. Rev. W. L. ANDERSON. Five lectures weekly.
28. The country school and the rural community. Miss M. CARNEY. Lectures beginning August 1.
29. Forms of co-operation among farmers. Assistant Prof. E. K. EYERLY. Ten lectures.
30. Rural literature. Mr. G. M. HOLCOMB. Ten lectures.
31. The movement in agricultural education. Prof. W. R. HART. Ten lectures.

3. *Election of Courses.*

Election of courses should be made at the time of registration. Every election is subject to the approval of the director and of the instructor whose course is elected. As it will be necessary to schedule several courses at the same hour, certain combinations of courses will be made unavailable. It should be especially noticed that certain courses are offered to a limited number of pupils only, and, as a rule, pupils will be accepted in these courses in the order of application. Each pupil should choose such combinations of courses as will keep two or three subjects in hand at the same time. This will meet the requirement that each one must take at least ten and not more than fifteen exercises a week, unless permitted to take more or less by special order of the director.

Attendance will be required in the courses elected. Some sort of examination, test or permanent note-book will be required in each course. Those who complete the courses in a satisfactory manner, including practically perfect attendance, will be given certificates at the close of the term showing what work has thus been completed.

There are no rules or regulations whatever. Persons are not admitted to the summer school who are not old enough to know how to behave, and every one is expected to know and conform to the usages of good society. This absence of rules has worked admirably in the past, and it gives every one a sense of freedom based on personal responsibility, the basis of all proper government, whether in school, college or the community.

4. *Conference of Agricultural Educators and Rural Social Workers.*

The last four days of the summer school will be given over to a conference of agricultural educators, rural social workers and others who are interested in developing country life. As its name indicates, this will be a conference in every sense of the word, every one being expected to take part in the informal discussions.

It is expected that persons representing the following lines of work will be present: rural school teachers, grade teachers of agriculture, high school teachers of agriculture, college teachers of agriculture, rural clergymen, rural librarians, grange lecturers, village improvement societies and others.

The plan of the program will be as follows: each of the above sections of workers will be asked to arrange a program, covering two hours in length, for their respective sections each forenoon. An afternoon general section will be held, at which some subject, such as the education of rural communities, the social life of rural communities, the religious life of rural communities, and the organization of forces for rural betterment, will be taken up each day.

Among the prominent speakers at the 1910 conference were Dr. S. A. Knapp of Washington, D. C., Dr. Josiah Strong of New York City, and Prof. Charles Zueblin of Winchester, Mass.

The bulletin of the 1911 summer school will be ready about March 1, and can be had by applying to the director.

D. ITINERANT INSTRUCTION.

1. Correspondence Courses.
2. Lecture Courses.
3. Other Itinerant Instruction.

1. THE CORRESPONDENCE COURSES.

a. Purpose and Description of the Work.

The correspondence courses announced in this circular are offered by the Massachusetts Agricultural College in response to calls from all sections of the State, from people who desire agricultural information, but who, for various reasons, cannot come to the college for it. These courses are designed to meet the needs of farmers, dairymen, stock breeders, fruit growers, market gar-

deners, floriculturists and teachers, either in elementary schools, high schools, academies or normal schools.

Since agricultural science and practice have changed and are changing so rapidly, it is the purpose to give a summary of the latest information on the subjects treated, yet in such language that any who pursue the study can readily understand the work. Additional courses, covering other subjects, will be added later.

b. Method of conducting the Work.

While a large number of books have been written on various agricultural subjects, few of them are especially adapted to correspondence course work. For this reason our courses are conducted principally by especially prepared lessons. These lessons partake somewhat of the nature of the lectures given in the regular college work. Whenever possible, a text-book is used for reference and supplementary study.

The lessons are sent out one at a time by the college, and are either accompanied or followed by a list of questions. When these are satisfactorily answered or discussed, the next lesson is sent, and so on.

It is recommended that students take up the work in some logical order, *i.e.*, the courses in "soils" and "manures and fertilizers" should precede those in "field crops," "fruit growing" or "market gardening."

After these preliminary courses have been completed, two or more courses of study may be pursued at the same time, provided the student can devote sufficient time to the work to carry it on successfully.

The courses are especially recommended to granges for study, and it is to be hoped that grange lecturers, or some other interested person, will organize study classes. When this is done, a representative of the college will visit the grange from time to time to conduct the class, discuss the work and offer suggestions.

c. Description of Courses.

1. Soil and soil improvement. Prof. W. D. HURD. The cost of the course is \$1.
2. Manures and fertilizers. Prof. W. D. HURD. The cost of the course is \$1.
3. Field crops. Assistant Prof. S. B. HASKELL. The cost of the course is \$1.
4. Farm dairying. Associate Prof. W. P. B. LOCKWOOD. The cost of the course is \$1.

5. Fruit growing. Prof. F. C. SEARS and Mr. A. J. NORMAN. The cost of the course is \$1.
6. Market gardening. Mr. C. S. HELLER. The cost of the course, including the text-book, is \$2.50.
7. Animal feeding. Mr. R. L. GRIBBEN and Mr. C. J. ROBINSON. The cost of the course is \$1.
8. Floriculture. Prof. E. A. WHITE. The cost of the course is \$1.
9. Farm accounts. Prof. J. A. FOORD. The cost of the course is \$1.
10. Agriculture in the common schools. Assistant Prof. F. B. JENKS. The cost of the course, including the text-book, is \$2.10.
11. Agricultural education. Prof. W. R. HART. The cost of the course is \$1.
12. Beekeeping. Assistant Prof. B. N. GATES. The cost of the course is \$1.
13. Forestry. Associate Prof. F. F. MOON. The cost of the course is \$1.

d. Expenses of the Courses.

In order that none shall enroll but those who are interested and desire to pursue earnest study, a small fee is charged. This has been fixed at the uniform rate of \$1 for each course, payable in advance at the time of enrollment.

This fee is not charged to cover cost of preparing the course, for this, in time of the instructors, is many times what is received, but it is to defray expenses of postage and material used in the preparation of the lessons, and to insure a higher quality of work from those who enroll.

The cost of a text-book, when one is used, is in addition to this enrollment fee.

Remittances should be made by money order or check.

e. Enrollment.

Students may enroll at any time by applying to the director of extension work, either personally or by letter. Enrollment should be made on the card which is furnished by the college.

Membership in the correspondence courses entitles the student to receive the books used in the various courses, and others, at reduced prices.

f. List of Reference Books for Supplementary Reading.

For those who desire to add some of the latest books to their libraries, for teachers who wish material for their work, or for librarians who desire to place on the shelves of their libraries, the latest agricultural publications, arrangements have been made with

the Orange Judd Publishing Company, Lafayette Place, New York City, N. Y., to supply books at reduced prices.

A classified list giving prices (postpaid) will be furnished by the college to all who apply for it.

2. THE LECTURE COURSES.

The college also offers lecture courses. The lectures can be obtained by any agricultural organization, grange, farmers' club, board of trade, women's club, Young Men's Christian Association, church club or school, or by others who are interested in problems pertaining to agriculture and country life. Single lectures, or a series comprising a course, can be arranged for.

LECTURES AND SUBJECTS. — The faculty of the college are, of course, men busy with regular college duties, and can undertake only so many outside lectures as will not seriously interfere with their regular college work. For this reason it is advisable that those desiring lectures for a fixed date should make a second, and perhaps a third, choice, also, of lecturers, in order to secure some one.

A Lecture without a Lecturer.

The college is now prepared to send a stereopticon, a written lecture and a set of lantern slides to accompany the lecture to responsible persons who desire to use these before public gatherings. A rental fee of \$1 and express both ways is charged. The following lectures will be ready for the winter of 1910-11: —

Clean milk, production and handling.

Apple growing.

Types and breeds of animals.

History, uses and culture of corn.

Potato growing.

The organization and work of the Massachusetts Agricultural College.

Home and school ground decoration.

Teaching agriculture, school gardening, etc., in the public schools.

Concrete: its use on the farm.

Other subjects will be announced later.

The Practical Demonstrations.

The college is prepared to send an expert who will bring with him the necessary apparatus, whenever possible, to give practical demonstrations of different operations connected with agricultural

practice. The following are some of the demonstrations most commonly given:—

The production and handling of clean milk.

Babcock milk testing.

Scoring and judging live stock.

Spraying fruit trees.

Packing apples.

Pruning and grafting.

Scoring and judging fruit.

Corn selection and judging.

Demonstrations in beekeeping as announced by Dr. Gates in circular.

Others may be given when requested.

Terms on which Lectures and Demonstrations are given.

The idea of offering these lectures to the public is that as large a number of people of the State may receive the instruction as is possible. When no admission fee is charged, the lectures and object lessons will be given free, provided the organization or individual requesting the lecture will pay the traveling expenses of the person giving the lecture. When admission is charged, the lecturer shall receive compensation in addition to his traveling expenses.

Correspondence is invited regarding the selection of subjects for a course of lectures.

3. OTHER ITINERANT INSTRUCTION.

Besides the correspondence and lecture courses and the practical field demonstrations, the college is carrying on several kinds of itinerant instruction. Calls are constantly made on the college for help to be given at a distance from the institution; and to meet these calls a corps of field agents is being engaged. These men and women will serve as traveling instructors, giving instruction varying in length from a single lecture to traveling-school courses lasting several days.

DEMONSTRATION ORCHARDS.—The college is establishing these orchards in all sections of the State. The owner of the land furnishes four or five acres and signs a contract to carry out the instructions of the college for fifteen years. The college furnishes the trees, a spraying outfit and the necessary supervision free of charge. Renovation plots in neglected orchards are also taken by the college for improvement for a period of five years. Educational meetings are held at these orchards each season.

EDUCATIONAL TRAINS. — In the past year a train consisting of five cars, extensively equipped with demonstration apparatus, was run over the lines of the Boston & Albany Railroad. A trolley train of five cars was run over the trolley lines centering in Springfield. Fifteen lecturers and demonstrators accompanied these trains.

EDUCATIONAL EXHIBITS AT FAIRS. — The college makes exhibits at the principal fairs in the State. In connection with these exhibits an extensive lecture program is given.

TRAVELING SCHOOLS. — When so requested the college organizes itinerant schools of instruction, lasting from three to five days, in good agricultural centers. The program is somewhat similar to that given at the college "farmers' week." The program is given without cost, providing the cost of halls and advertising is met by the community where the school is held.

TRAVELING LIBRARIES. — To meet an increasing demand for information concerning agricultural books the college is preparing to send to libraries and schools a collection of some of the best books on agriculture and allied subjects.

Extension Work by Students.

In order to aid in a practical way in the solution of the problems in the rural community, a new line of work has been undertaken by the extension department as student extension work.

Members of the college Young Men's Christian Association who have shown ability in community building are largely employed in this form of extension. The object of the work is two-fold: (1) to develop the country boy and acquaint him with the possibilities of the farm, indirectly reaching his parents and ultimately amalgamating the various factors of the community for the purpose of fostering a more wholesome community spirit; (2) to train the college students to cope with the rural problem in order that later they may exercise the right leadership in the community.

The work is being developed with regard to religious, educational, social and physical interests. The religious work embraces the teaching of Bible classes, leadership in singing at Christian Endeavor and other meetings, the holding of meetings in different towns by members of the college Young Men's Christian Association, the encouragement of church socials, etc.

The educational work includes study of the social and economic problems of the town, the teaching of English to foreigners, conducting classes in agriculture, with practical work, lecturing on

agricultural subjects, beautifying home grounds, developing home flower gardens, leading nature-study tramps, organizing debates and encouraging boys to further schooling.

The social effort is to encourage and develop all activities in town tending to create a broader and more unified community interest; such activities are church entertainments, school entertainments, musicals, etc.

Physical education is given through talks about clean living and physical culture, and by development of different branches of athletics under efficient moral leadership.

The plan involves much competition, tending to bring the people of the different towns into a closer relationship.

The work thus far has been confined to those communities within easy reach of the college, but it will gradually extend over a wider area. The work is popular and promises to become one of the most important agencies in the development of the rural community.

Miscellaneous Itinerant Instruction.

A number of other kinds of work are demanded of the college through the extension work. Among these might be mentioned aid in the organization of crop and animal improvement societies, the conducting of demonstration experiments and plot tests in all sections of the State, making agricultural surveys, doing advisory work with schools, State institutions and individuals, furnishing the services of agricultural experts to those who need help, giving advice on farm management, and answering thousands of inquiries each year.

In short, the spirit of the extension work is that of service, and an effort is made through it to render the departments of the Massachusetts Agricultural College as helpful to the people of the Commonwealth as they can be. Correspondence is invited from any who desire such help as has been spoken of. Letters should be addressed to the Director of Extension Work, Massachusetts Agricultural College, Amherst, Mass.

GENERAL INFORMATION.

GENERAL INFORMATION.

A. FINANCIAL AND ADMINISTRATIVE.

STUDENT EXPENSES.

TUITION. — Tuition is free to citizens of the United States; but students who are citizens of Massachusetts should apply to the senator of the district in which they live for a free scholarship. Blank application forms may be obtained from the registrar. The tuition charged persons not citizens of the United States is \$120 a year.

DORMITORIES AND BOARD. — The college has dormitory accommodation for about 64 students. The rooms in the dormitories are occupied chiefly by the upper classmen, hence new students are obliged to room in private houses. The rooms in the college dormitories are unfurnished. They are mostly in suites of three, — one study room and two bed rooms. They are heated with steam and lighted with electricity. Students care for their rooms themselves. The rent for each person ranges from \$39 to \$66 a year. The rent for furnished rooms in private houses ranges from \$1.50 to \$3 a week for each occupant. All correspondence in regard to rooms should be addressed to the dean of the college.

Board can be had at the college dining hall. Board is furnished at cost. At present the price of board is \$4 a week. The price is determined by adding to the audited rate of the previous three months' period 5 per cent. At the end of the period, final settlement is made on the basis of actual cost.

EXPENSES.

The necessary college expenses per year are estimated as follows: —

Tuition: Citizens of Massachusetts free through State scholarships; other citizens of the United States free; foreigners, \$120 a year.

	Low.	High.
Room in college dormitories or in private houses, ...	\$39 00	\$110 00
Board in college dining hall, \$4 a week, ...	144 00	144 00
Laundry, 50 cents to 85 cents a week, ...	18 00	30 00
Military uniforms, first year, ...	13 50	13 50
Laboratory fees, ...	2 00	20 00
Books, stationery and other miscellaneous, ...	23 50	32 50
	\$240 00	\$350 00

OTHER EXPENSES. — Prospective students should understand that the above estimates cover expenses which may be called strictly college expenses, and that there are other financial demands made upon students which they should expect to meet. Chief among these are class assessments, support for the Musical Association and the Y. M. C. A., and taxes levied for maintenance of various student organizations, such as the Social Union, Athletic Association, college "Signal" (paper), etc. Such expenses vary from \$15 to \$30 a year. Additional financial responsibility is assumed by students joining a fraternity. Students rooming in college dormitories are obliged to equip their rooms with furniture. The college assumes no responsibility in regard to the safe-keeping of student furniture in dormitories, either during term time or vacation, except under such special arrangement as may be made with the treasurer. Besides the amount necessary for clothes and traveling the economical student will probably spend between \$250 and \$350 a year.

STUDENT AID.

SELF HELP. — A number of students find opportunities for earning money without depending on the labor fund, and many rely upon labor of some sort to earn their way through college. A few men have paid all their way through college; a great many more have paid a large part of their expenses; and many have earned a small proportion of the cost of their course. But the college recommends that no new student enter without having at least \$150 with which to pay his way until he can establish himself at work. The college does not encourage students to enter without money in the expectation of earning their way. The ordinary student will find it better either to work and accumulate money before coming to college, or to take more than four years in college, or, instead, to borrow money with which to complete his course. No student should undertake work that interferes with his studies, and students should remember that, owing to the large number of applications for labor-fund employment, no one man can receive a large amount from that source.

LABOR FUND. — An annual appropriation of \$7,500 for student labor is received from the State. So far as possible needy students will be employed in some department of the college. The Department of Agriculture and the Department of Horticulture usually afford the most work. Application for student labor should be made directly to the president. Applicants must present a certificate signed by parent or guardian and by one of the selectmen of the town in which they reside, showing that they need the

aid. Students whose department or class work is not satisfactory are not likely to be continued in student labor.

SPECIAL NOTICE TO NEEDY STUDENTS.—*In the last year or two the demand for paid labor on the part of new students has exceeded the amount of employment that the college can offer. The college cannot promise work for any students, particularly freshmen. It accordingly urges prospective students who are dependent upon their own efforts not to undertake the course before they have enough money to carry them through or nearly through the first year.*

STUDENT ACCOUNTS.

The following rules are in force concerning student accounts:—

No student will be allowed to graduate until all bills due from him to the institution are paid.

College charges, such as room rent, laboratory fees, tuition, etc., must be paid strictly in advance at the beginning of each semester. No student will be allowed to register until such payments are made.

Every student boarding at Draper Hall shall pay at the beginning of each semester at least one month's board in advance; and no student will be allowed to continue to board at Draper Hall if more than one week in arrears in his payments.

All money due for student labor shall be applied on account toward any bills that the student may owe to the institution.

LABORATORY FEES.

Botany:—	Per Semester.
Graduates, ...	\$4 00
Courses 2, 3, ...	3 00
Course 4, ...	2 00
Course 5, ...	1 00
Courses 7, 9, 11, 13, ...	3 00
Chemistry:—	
Courses 1, 2, 11, 13 and 14, each, ...	3 00
Courses 4, 5 and 6, each, ...	4 00
Courses 9, 10, 15, 17A, B, C or D, 18A, B, C or D, ...	5 00
Entomology:—	
Graduate, ...	3 00
Entomology 3, ...	3 00
Entomology 4, ...	3 00
Landscape gardening:—	
Landscape gardening 1, 2, ...	2 50
Landscape gardening 3, 4, 7, 8, ...	4 00
Landscape gardening 6, ...	1 00
Drawing 1, 2, ...	2 50
Zoölogy:—	
Elementary 1, ...	2 00
Invertebrate 3, ...	4 00
Vertebrate 4, ...	4 00

B. ACADEMIC AND DEPARTMENTAL.

DEGREES.

Those who complete the four-years course receive the degree of bachelor of science. Those who receive this degree may also, upon payment of a fee, receive the degree of bachelor of science (B.Sc.) from Boston University; but the candidate must meet the conditions imposed by the university concerning preparatory studies. The fee for graduation from the college is \$5; that for the degree of Boston University is \$10.

Graduate students who complete the assigned courses will receive the degree of master of science (M.Sc.) (fee, \$10). Credit may sometimes be allowed toward this degree for teaching or other advanced work done in some department of the college.

Graduate students who complete the required three-years course of study and present a satisfactory thesis will be granted the degree of doctor of philosophy (fee, \$25).

Those to whom degrees are awarded must present themselves in person at commencement to receive them. Honorary degrees are not conferred.

SCHOLARSHIPS AND PRIZES.

Scholarships.

The income of gifts from different persons is distributed in scholarships to worthy students requiring aid. The funds supporting these scholarships are:—

1. The Mary Robinson fund of \$1,000, the bequest of Miss Mary Robinson of Medfield.
2. The Whiting Street fund of \$1,000, the bequest of Whiting Street of Northampton.
3. The Henry Gassett fund of \$1,000, the bequest of Henry Gassett of North Weymouth.

Prizes.

Prizes are given annually in several departments for excellence in study or for special achievement. The prizes offered for 1910 are:—

AGRICULTURE.—The Grinnell prizes (first, second and third), given by the Hon. William Claflin of Boston in honor of George B. Grinnell, Esq., of New York, to those members of the senior class who pass the best, second best and third best examinations,

oral and written, in theoretical and practical agriculture. They are \$25, \$15 and \$10.

BOTANY. — The Hills prizes (amounting to \$35), given by Henry F. Hills of Amherst, will be awarded to members of the senior class as follows: for the best herbarium, \$15; for the best collection of Massachusetts trees and shrubs, \$10; for the best collection of Massachusetts woods, \$10. No collection deemed unworthy of a prize will be considered. In 1911, a prize of \$5 is offered to that member of the sophomore class who presents the best herbarium of native flowering plants.

FORESTRY. — The J. W. D. French prize (\$25) is given by the Bay State Agricultural Society to that member of the senior class who writes the best essay on forestry.

GENERAL IMPROVEMENT. — The Western Alumni Association prize (\$25) is given to that member of the sophomore class who during his first two years in college has shown the greatest improvement in scholarship, character and example.

PUBLIC SPEAKING. — The Burnham prizes are awarded as follows: to the students delivering the best and second best declarations in the Burnham contest, \$15 and \$10, respectively. The preliminary contests in declamation are open, under certain restrictions, to freshmen and sophomores.

The Flint prizes are awarded as follows: to the students delivering the best and second best orations in the Flint contest, a gold medal and \$20 and \$15, respectively. The preliminary contests in oratory are open, under certain restrictions, to all regular students.

The prizes in debate are awarded as follows: to each of the three students ranking highest in the annual debating contest, a gold medal and \$15. The preliminary contests in debate are open, under certain restrictions, to all regular students.

Winter Course Prizes for 1910.

Given by the Bowker Fertilizer Company, Boston, to the student who is most familiar with the nature and composition of fertilizers and their use, one-half ton Stockbridge fertilizer.

Military Diplomas.

Military diplomas are given to those men receiving the degree of bachelor of science who by their work in the Department of Military Science have shown themselves worthy of distinction.

These diplomas recommend those receiving them for commissions in the United States army or the militia of the several States.

EQUIPMENT.

AGRONOMY. — The work in agronomy is carried on by means of lectures, laboratory work and field work. The laboratories are in the north wing of South College. The seed laboratory is equipped with samples of the different grains and seeds of economic importance in field culture, and with apparatus for the study and testing of these seeds, including microscopes and the apparatus necessary for viability and purity tests. The soil laboratory is well equipped with apparatus for the study of the physical properties of soils, including an electric centrifuge; an electric resistance thermometer for determining soil and other temperatures; evaporimeters and drying ovens; and good balances. For the work in drainage there is available a surveyor's transit, a wye level, drainage levels, rods, steel tapes, surveyors' pins, and a set of drainage tools. The college farm may also be considered a part of the agronomy laboratory.

ANIMAL HUSBANDRY. — The most important part of the equipment for laboratory work in animal husbandry is the new judging pavilion, which will be completed by Jan. 1, 1911. This will give new opportunities for practice work in management of live stock, together with demonstrations in judging. Another very essential part of the equipment for this department is the live stock of the college farm, which includes pure bred and grade Ayrshire, Guernsey, Holstein and Jersey cattle, French coach and Percheron horses, and Berkshire swine. A set of plaster-of-paris models of individuals of foreign and domestic breeds of horses, cattle, sheep and swine, and a collection of the different food stuffs available for the use of the New England farmer, are included in the equipment for this work.

BOTANY. — The department of botany occupies Clark Hall, a brick building 55 by 95 feet, two stories high, with basement and attic. It has two lecture rooms, one seating 154 and the other seating 72 people; one seminar and herbarium room; a large laboratory for sophomore and junior work, and one for senior work; and three rooms specially fitted for graduate students. The experiment station laboratories devoted to botanical research are also in this building. A small museum contains material especially useful in the teaching and illustration of plant phenomena; and on the third floor is a collection of Massachusetts timber trees, specimens

showing peculiar formations of plant growth, and various specimens illustrative of scientific methods of treating trees.

The laboratories and lecture rooms are of modern construction, finely lighted and supplied with all necessary conveniences. The basement contains a bacteriological laboratory, a seed and soil room; and a convenient workshop provided with benches for wood and metal work, an electric motor, a power lathe, and other tools and appliances. In the senior laboratory, is a room designed especially for physiological work; this laboratory is well supplied also with apparatus for the study of simple phenomena in plant physiology, such as respiration, metabolism, transpiration, heliotropism, etc. The herbarium contains 15,000 species of flowering plants and ferns, 1,200 sheets of mosses, 1,200 sheets of lichens and liverworts, and about 12,000 sheets of fungi. The laboratory is equipped with 90 modern compound microscopes and a number of dissecting microscopes, microtomes and a large series of charts. A conservatory 28 by 70 feet is connected with the laboratory. This is designed for experiment work and for housing material often needed in the laboratory.

CHEMISTRY. — The department of chemistry has rooms adapted to chemical uses, supplied with a large assortment of apparatus and chemical materials. The lecture room on the second floor seats 70 students. Immediately adjoining it are four smaller rooms for apparatus and the preparation of materials for the lecture table. The laboratory for beginners is furnished with 40 working-tables. Each table is provided with reagents and apparatus for independent work. A well-equipped laboratory for advanced work is also provided. The weighing room has 6 balances and improved apparatus for determining densities of solids, liquids and gases. The equipment includes also a microscope, a spectroscope, a polariscope, a photometer, a barometer, numerous models, and an extensive collection of industrial charts, and there is a valuable and growing collection of specimens and samples. The latter includes rocks, minerals, soils, raw and manufactured fertilizers, foods, milk products, fibers, various other vegetable and animal products and artificial preparations of mineral and organic compounds. With this should also be mentioned a series of preparations used for illustrating the various stages of different manufactures, from raw material to finished product.

DAIRYING. — Two large, well-drained, cement-floored rooms in the South College are used for dairy work. These are equipped with a milk heater, separators, coolers and aerators, a pasteurizer,

ripening vats, churns, butter workers, a mechanical can washer, a sterilizer, and other small apparatus necessary to a well-equipped dairy or butter factory. A third room is equipped with hand and power Babcock milk-testing machines and other apparatus used for milk and butter testing. These rooms have individual lockers for students. The new sanitary dairy and stable give an opportunity for practical laboratory work in the production and handling of certified milk.

DINING HALL. — Draper Hall, a brick colonial building, equipped with the modern conveniences of a dining hall, was opened in 1903. The dining service is under the supervision of the college.

DRAWING. — Two rooms on the second floor of Wilder Hall are occupied by the classes in drawing. They are equipped with tables and adjustable drawing stands. The necessary materials and implements are provided. The equipment includes drawing models, and plaster casts of leaves, flowers, fruits, human and architectural details, and garden ornaments, two universal drafting machines, an eidograph, centrolineads, a set of ship splines and French curves, complete water-color outfits, automatic crosshatchers and protractors.

ENTOMOLOGY. — *Entomological Laboratories.* — The equipment for work in entomology is perhaps unexcelled in this country. In the new fireproof entomological and zoölogical building, first used in the fall of 1910, are fine lecture rooms, laboratories and museums for use in the different courses. The senior laboratory will accommodate 70 students at one time; a desk, equipped with compound microscope and accessories, together with glassware, reagents, etc., and supplied with electric light and gas, is provided for each student. Dissecting microscopes, microtomes and other apparatus are available for use. The graduate laboratory is similarly equipped. It will accommodate 20 students. The large and rapidly growing collections of insects are in a room adjoining both laboratories. In the library of the building is an excellent collection of the more important books and journals treating of entomology, and many more are accessible in the college library and in the private libraries of the professors, in all making available more than 25,000 volumes, many of which cannot be found elsewhere in the United States. A card catalogue giving references to the published articles on different insects contains more than 60,000 cards, and is the largest index of its kind in the United States, and probably in the world. In the basement is a pump room where may be studied the construction of the different types of spray pump, methods of

repairing them; hose, couplings, nozzles and the other parts of spraying outfits are provided, not only for examination but for use. In another room, provided with chemical desks and apparatus, methods for the determination of the impurities and adulterations of insecticides are taught. As the insectary of the Massachusetts Agricultural Experiment Station is in the same building, the facilities it offers are also available. A greenhouse, where plants infested with injurious insects are under observation and experimental treatment, is also open to students. Photographic rooms with cameras and other photographic apparatus are provided, and the large greenhouses, gardens, orchards and grounds of the college offer further opportunities for the study of injurious insects under natural conditions.

FARM ADMINISTRATION.—The college farm of 190 acres is under the supervision of the Department of Farm Administration, and furnishes demonstration material. It includes improved land, pasture land and a farm wood lot. The improved land illustrates the value of good culture and the best known methods for the maintenance of fertility. The work in this department includes the production of the common field crops, and the care and raising of the different classes of live stock mentioned under animal husbandry. The farm is equipped with suitable buildings and good machinery for the work carried on, of which the production of certified milk is an important branch. Several good farms in the vicinity, illustrating types of both special and general agriculture, may be inspected and studied.

FLORICULTURE.—The department of floriculture aims to give the student a thorough knowledge of all phases in greenhouse design and construction and greenhouse heating, and in the culture of florists' crops. It is intended to train men for commercial floriculture and for the management of conservatories on private estates and parks and in cemeteries. The course is outlined to combine theoretical, technical and practical work in the most comprehensive manner possible. Probably no agricultural college has a department of floriculture better equipped than this. The legislative appropriation of 1908 has made possible the erection of a durable, practical, commercial range, composed of palm, fern, orchid, violet, carnation, rose and students' houses. French Hall, with its large laboratories, class rooms and offices, furnishes excellent facilities for the purposes of instruction. Besides the new glass houses, there are older houses suitable for growing bedding plants and chrysanthemums, and frames for the growing of annual

and herbaceous perennial plants, violets and pansies. Many excellent specimens of trees and shrubs are growing on the college grounds, furnishing valuable material for the study of plant materials.

FORESTRY. — The aim of the course in forestry is to prepare men for the advanced study in forestry schools, and at the same time, by laying particular stress on local conditions, to enable them to handle the farm wood lot in the same scientific manner as the rest of the farm. The college is well situated for forestry study. There is a good forest nursery on the college grounds; also two typical farm wood lots. In the vicinity are considerable areas of typical New England forest land.

GEOLOGY. — A large, well lighted laboratory for geology, 27 by 50 feet, is in the basement of the new building for entomology, zoölogy and geology. This is equipped with cabinets, models, charts and a teaching collection of rocks. It has a seating capacity of 50 persons. Adjoining this is a smaller laboratory, 21 by 27 feet, for mineralogy, supplied with gas and cabinets for models, crystals and minerals. There is also a small laboratory for grinding thin sections and a private laboratory, 6 by 19 feet, for analysis work. The geological museum is 27 by 48 feet. It has 6 large cases for exhibition purposes.

The equipment for geology is being enlarged. At present, in addition to the general items mentioned above, it consists of a petrographic microscope, an illustrative series of thin sections, a small collection of invertebrate fossils, some casts of vertebrate fossils, a collection of the building stones of Massachusetts and a duplicate set of the Edward Hitchcock survey collection of the rocks and minerals of Massachusetts.

HEATING, LIGHTING AND POWER. — The college supplies its own light, heat and power, including electricity for the night lighting of the campus and its approaches. The machinery of the barn, the dairy and other buildings is operated by electricity generated at the power-house. The college has also a machine shop.

LANDSCAPE GARDENING. — The work in landscape gardening is developed in a strong technical four-years course; the first two years are occupied with required studies, including botany, horticulture, surveying and mathematics, and the last two years are devoted to more specialized studies in landscape gardening, arboriculture, floriculture, entomology, botany and mathematics. The environment is unusually favorable. The strictly technical work in landscape gardening is taught in light and comfortable drafting

rooms, fully furnished with instruments and accessories for thorough work. There is a well-selected library, and the equipment of surveying and drafting instruments is unusually complete and practical.

LIBRARY.—The library—stack room, reading room and office—occupies the entire lower floor of the library-chapel building. It contains nearly 34,000 volumes and a large number of pamphlets, hitherto inaccessible, but which are being put into good working order as fast as possible. Works of a scientific character predominate, but economics, literature and history are well represented and are receiving due attention. The reading room provides a variety of periodical literature, both technical and popular, encyclopedias and general reference books, and a select collection of works for general reading.

The library is now being reclassified and recatalogued, to make the splendid collection of material here gathered together readily accessible and of the greatest working value. Every effort is being made toward developing the library into a vital intellectual center of college life, of equal value to every student, teacher and teaching department. In consequence, only the most cordial relations are cherished, and the fewest and most imperative rules concerning the circulation of books and deportment are enforced.

Lectures are given to regular and short course students to enable them to make the best use of the library. Emphasis is laid upon the proper use of the card catalogue, periodical indexes, bibliographies and guides; also, in general, assigned and class-room work, and essay and debate work.

The library hours are from 7.45 A.M. to 9 P.M. every week day, and from 9 A.M. to 2 P.M. on Sundays, in term time. Shorter hours prevail during vacations.

MARKET GARDENING.—The purpose of the courses in market gardening is to acquaint the student with the theories and practice of market gardening so that he will be able to carry on the business intelligently. The equipment available for practical work consists of 10 acres of good gardening land; a large collection of horse and hand garden tools; hot-beds and cold-frames; and lettuce, cucumber and tomato houses. The students therefore have opportunity both to study and to practice the important branches of the business. Classes are taught in French Hall, a new building fitted with class rooms and a laboratory particularly equipped for floriculture and market gardening. A good library of works on vegetable gardening is available.

MATHEMATICS, PHYSICS AND CIVIL ENGINEERING. — *Surveying.* — The department has a considerable number of the usual surveying instruments, with the use of which the students are required to become familiar by doing field work. Among the larger instruments are 2 plain compasses, a railroad compass with telescope, a surveyor's transit, 3 engineer's transits with vertical arc and level, a Brandis solar transit, a solar compass, an omnimeter with verniers reading to 10 seconds, adapted to geodetic work, a Queen plane table, 2 wye levels, a dumpy level, a builder's level, a sextant, a hand level, and a large assortment of leveling rods, flag poles, chains, tapes, etc. For drafting, a vernier protractor, a pantograph, a parallel rule, etc., are available. The department also has a Fairbanks cement testing outfit.

Physics. — Among the apparatus in use for instruction in general physics are a set of United States standard weights and measures, precision balances, a spherometer, vernier calipers, a projection lantern, etc.; in mechanics, a seconds clock, systems of pulleys and levers, and apparatus to illustrate the laws of falling bodies and motion on an inclined plane, and the phenomena connected with the mechanics of liquids and gases. The department is equipped with the usual apparatus for lecture illustration in heat, light and sound; in electricity, the equipment consists of apparatus for both lecture illustration and laboratory work, including a full set of Weston ammeters and volt meters, a Carhart-Clark standard cell, a Mascart quadrant electrometer, a Siemens electro-dynamometer, and reflecting galvanometers and Wheatstone bridges for ordinary determinations of currents and resistances.

MILITARY SCIENCE. — This department makes use of the campus for battalion drill, and has a special building in which there is a drill room 60 by 135 feet, an armory, an office for the commandant, a field-gun and gallery practice room and a large bathroom. The national government supplies Krag-Jorgensen rifles, with complete equipments and ammunition. The State supplies instruments for the college band. Students are held responsible for all articles of public property in their possession. The college owns an excellent target range for rifle practice, lying a short distance out of the village.

PHYSICAL EDUCATION. — The gymnasium and armory has a floor space of 5,000 square feet, and is 30 feet high, well lighted and ventilated. The room used for exercise and recreation is equipped with modern developing apparatus and two hand-ball courts, and is large enough for basket ball. The apparatus can quickly be

removed to clear the floor. An out-door board track enables students to secure track practice through the winter. Steel lockers and bathrooms have been installed in North and South colleges, and the gymnasium has been fitted with a bathroom. The gymnasium is open from 9 A.M. to 10 P.M., and exercise may be taken at such hours as do not conflict with military drill or physical education classes. The regulation costume for class exercise consists of a white track suit and white, rubber-sole shoes.

POMOLOGY.—The department of pomology has 10 acres of orchard, including apple, pear, peach, plum, cherry and quince trees. Of particular interest is the large collection of these fruits on the various dwarf stocks, showing many types of training. The recent revival of interest in dwarf fruits makes these dwarf orchards of especial value to students. There is also a commercial vineyard and a smaller one; in these are shown the principal types of trellis and the leading methods of training grapes. Several acres are used in growing the various kinds of small fruits, such as strawberries, raspberries, blackberries, currants and gooseberries. There are also extensive nurseries, where all of these various types of fruits are grown, in which students may see them in all stages of development.

The department has a good equipment of orchard and nursery tools of all the principal types, the use of which enables students to learn the value of each type. For other orchard operations, such as spraying and pruning, the most approved makes of pumps, nozzles, pruning saws, knives, etc., are provided. For laboratory work in systematic pomology there is a collection of more than 100 wax models of apples and plums in natural colors, which are particularly valuable in identifying varieties of these fruits unknown to the student. The laboratory is also furnished with a large number of reference books on pomology; and fruit in a fresh condition is available in great variety, not only from the college orchards but from other parts of Massachusetts and from many other States. In 1909–10, for instance, apples for class use were received from British Columbia, Ontario, Quebec, Nova Scotia, Iowa, Wisconsin, Michigan, Connecticut, New York, Oklahoma, Kansas, Colorado, Oregon, New Jersey and Vermont, besides collections of grapes from California and citrous fruit from Florida and Texas.

PUBLIC SPEAKING.—In connection with the work in public speaking, three regular contests are held during the year. The Burnham contest in declamation is open to freshmen and sopho-

mores; the Flint contest in oratory and the annual debating contest are open (under restrictions) to all regular students. These contests furnish a very practical and necessary experience to all students interested in improving themselves in the art of public speaking. Prizes are given for excellence in the contests. Inter-college contests are arranged by the Public Speaking Council. One credit is given, except to freshmen, for a year of work in the college Debating Club.

VETERINARY SCIENCE AND BACTERIOLOGY.—The department of veterinary science and bacteriology occupies a modern laboratory and hospital stable, built in accordance with the latest principles of sanitation. Every precaution has been taken in the arrangement of details to prevent the spread of disease, and to provide for effective heating, lighting, ventilation and disinfection.

The main building contains a large working laboratory for student use, and several small private laboratories for special work. There are a lecture hall, a museum, a demonstration room, a photographing room and a work shop. The hospital stable contains a pharmacy, an operating hall, a post-mortem and dissecting room, a poultry section, a section for cats and dogs, and 6 sections, separated from each other, for horses, cattle, sheep and swine. The laboratory equipment consists of a dissectible Auzoux model of the horse and Auzoux models of the foot and the leg, showing the anatomy and the diseases of every part. The laboratories also have modern, high-power microscopes, microtomes, incubators and sterilizers, for work in bacteriology and parasitology. There are skeletons of the horse, the cow, the sheep, the dog and the pig, and a growing collection of anatomical and pathological specimens. The lecture room is provided with numerous maps, charts and diagrams.

ZOÖLOGY.—The college offers increased facilities for the study of zoölogy. In the new building for entomology, zoölogy and geology are spacious laboratories for both undergraduate and graduate work. On the first floor is a large sophomore laboratory, 27 by 100 feet, with a present seating capacity of 100 persons. Adjoining this is a smaller room, 20 by 27 feet, for junior and senior courses. On the second floor is a laboratory, 20 by 32 feet, for advanced work. All laboratories are equipped with gas. The equipment consists of 80 compound microscopes and accessories, 70 dissecting microscopes, microtomes and accessories, paraffine baths, incubator, dissecting instruments, glassware and other necessary apparatus. Small aquaria and vivaria will be added.

The large amphitheater lecture hall is used jointly by the departments of entomology and zoölogy-geology. It is equipped with charts and models. The zoölogical museum is drawn upon at all times for illustrative material. The zoölogical museum is 27 by 48 feet. The main room is on the first floor of the building. Above this, on a level with the second floor, is a large gallery. On the main floor are 8 large wall cases and 5 large floor cases for exhibition purposes. The gallery has 1 large wall case and 2 floor cases, with space for 10 additional cases. The zoölogical collection consists of nearly 12,000 specimens. All the chief phyla are represented. Adjoining the museum is a preparator's room for the curator. The museum is open to the public from 1 to 5 P.M. on Saturdays, and on other week days from 3 to 5 P.M. The curator is Assistant Professor Gordon.

COLLEGE ACTIVITIES.

Religious Services.

Chapel services are held four days a week. On Wednesday, instead of chapel an afternoon assembly is held, for which an attempt is made to secure speakers who will present important current subjects. Students are required to attend chapel and assembly.

The Young Men's Christian Association of the college holds a short religious meeting in the chapel on Thursday evenings, and conducts several Bible classes. For part of the year the college and the Young Men's Christian Association unite in Sunday vespers and in Sunday morning talks in the chapel. At vespers a prominent clergyman or layman speaks.

Student Organizations.

A large number of student organizations furnish opportunity for work and leadership to students.

The Massachusetts Agricultural College Social Union has recently been established. All students become members by paying a small fee; the Union is designed to become the center of student interests. It has equipped in North College a trophy room and a large lounging room for music, reading and study. In the basement of this building there is also a game room for pool and billiards. The Union gives, in the fall and winter months, a series of entertainments, free to the students and faculty.

The Young Men's Christian Association is active both socially and religiously.

The College Senate is composed of representatives of the senior and junior classes. It serves as a general director of undergraduate conduct, and represents before the faculty the interests of the student body.

The musical organizations include an orchestra, a glee club, and a quartette. These furnish music for college meetings, and occasionally give concerts. A military band is maintained as part of the cadet corps.

The Athletic Association represents in the college the interests of the football, baseball, track, hockey and tennis teams.

Among the other clubs are the Rifle Club, the Mettewampe Club, organized for walking and other outdoor recreation, and a debating club. Provision is made for credit for a specified amount of work done under supervision in the Debating Club, and intercollege debates are held. The Public Speaking Council was organized in March, 1910.

The college publications are the "Signal," published weekly by the student body, and the "Index," published annually by the junior class.

Clubs, Conferences and Seminars.

The All M. A. C. Chemists is an organization of all persons interested in chemistry who have been connected with the college in the past or are now connected with it. This club, by meetings, lectures, excursions, etc., promotes instruction in practical agricultural chemistry.

The Stockbridge Club is an organization of students specially interested in practical agriculture, horticulture and floriculture. Regular meetings are addressed by outside speakers, and members present papers and engage in discussions.

The Language Conference, meeting about once a month, is composed of the instructors in the departments of English and Modern Languages and the students who are enrolled in elective courses in these departments.

A seminar for juniors and seniors is conducted by the division of agriculture. The division of horticulture likewise conducts conferences or seminars.

An entomological club and a zoölogical club are also maintained by those specially interested in these departments of college work.

PRIZES AWARDED FOR THE YEAR 1910.

GRINNELL PRIZES. — First prize, \$25, Frank Tuttle Haynes; second prize, \$15, Roger Sherman Eddy; third prize, \$10, Francis Stone Beeman.

BOTANICAL PRIZES. — For the best herbarium, \$15, Sumner Cushing Brooks. For the best collection of Massachusetts trees and shrubs, \$10, Sumner Cushing Brooks. For the best collection of Massachusetts woods, \$10, Sumner Cushing Brooks.

FORESTRY PRIZE. — For the best essay on arboriculture, \$25, Edgar Morton Brown.

GENERAL IMPROVEMENT PRIZE. — Given to that member of the sophomore class who, during his first two years in college, has shown the greatest improvement in scholarship, character and example; \$25, Herbert James Stack.

PRIZES IN PUBLIC SPEAKING. — In debating: Irving Craig Gilgore, 1911, \$15, and gold medal; Harold Francis Willard, 1911, \$15, and gold medal; Benjamin Gilbert Southwick, 1912, \$15, and gold medal. In oratory: Theodore Joseph Moreau, 1912, \$20, and gold medal; Louis Brandt, 1910, \$15. In declamation: Horace Mitchell Baker, 1913, \$15; Frederick David Griggs, 1913, \$10.

MILITARY HONORS. — The following officers were reported to the Adjutant-General of the United States and to the Adjutant-General of Massachusetts for their high merit in military work: Maj. Roger Sherman Eddy, Capt. Henry Alvan Brooks, Capt. Frank Tuttle Haynes, Capt. Horace Wells French, Capt. Edward Harrison Turner, First Lieut. Lawrence S. Dickinson.

DEGREES CONFERRED AND
ROLL OF STUDENTS.

DEGREES CONFERRED—1910.

MASTER OF SCIENCE.

Chapman, George Henry, Amherst, Massachusetts Agricultural College, B.Sc.,
1907.

BACHELOR OF SCIENCE (B.Sc.).

Allen, Rodolphus Harold, ...	Fall River.
Annis, Ross Evered, ...	Natick.
Armstrong, Robert Pierson, ...	Rutherford, N. J.
Bailey, Dexter Edward, ¹	Tewksbury.
Bailey, Justus Conant, ...	Wareham.
Beeman, Francis Stone, ...	West Brookfield.
Blaney, Jonathan Phillips, ...	Swampscott.
Brandt, Louis, ...	Everett.
Brooks, Henry Alvan, ^{1,2}	Cleveland, O.
Brooks, Sumner Cushing, ²	Amherst.
Brown, Louis Carmel, ¹	Bridgewater.
Burke, Edward Joseph, ²	Holyoke.
Clarke, Walter Rowe, ¹	Milton-on-Hudson, N. Y.
Cloues, William Arthur, ...	Warner, N. H.
Cowles, Henry Trask, ²	Worcester.
Damon, Edward Farnham, ²	Concord Junction.
Dickinson, Lawrence Sumner, ^{1,2}	Amherst.
Eddy, Roger Sherman, ¹	Dorchester.
Everson, John Nelson, ...	Hanover.
Fisk, Raymond John, ...	Danvers.
Folsom, Josiah Chase, ¹	Billerica.
Francis, Henry Russell, ...	Dennisport.
French, Horace Wells, ¹	Pawtucket, R. I.
Haynes, Frank Tuttle, ¹	Sturbridge.
Hayward, Warren Willis, ...	Millbury.
Hazen, Myron Smith, ...	Springfield.
Holland, Arthur Witt, ...	Shrewsbury.
Hosmer, Charles Irwin, ...	Turners Falls.
Johnson, William Clarence, ¹	South Framingham.
Leonard, William Edward, ²	Belmont.
McLaine, Leonard Septimus, ^{1,2}	New York, N. Y.
Mendum, Samuel Weis, ²	Roxbury.
Nickless, Fred Parker, ...	Billerica.
Oertel, Charles Andrew, ...	South Hadley Falls.
Partridge, Frank Herbert, ...	Cambridge.
Paulsen, George William, ¹	New York, N. Y.

¹ Military diploma.

² Boston University diploma.

Schermerhorn, Lyman Gibbs, ¹	.	.	.	.	Kingston, R. I.
Thomas, Frank Lincoln, ¹	.	.	.	.	Athol.
Turner, Edward Harrison, ¹	.	.	.	.	Reading.
Urban, Otto Velorous Taft, ¹	.	.	.	.	Upton.
Vinton, George Newton,	.	.	.	.	Sturbridge.
Waldron, Ralph Augustus,	.	.	.	.	Hyde Park.
Wallace, William Newton, ²	.	.	.	.	Amherst.

Total, 43.

¹ Military diploma.

² Boston University diploma.

ROLL OF STUDENTS.

GRADUATE STUDENTS. — CANDIDATES FOR A DEGREE.

Anderson, David Wadsworth,	Manchester, N. H.,	-	-
B.Sc., New Hampshire State College,	1910.		
Bartlett, Oscar Christopher,	Westhampton,	-	-
B.Sc., Massachusetts Agricultural College,	1909.		
Bourne, Arthur Israel,	Kensington, N. H.,	-	-
A.B., Dartmouth College,	1907.		
Holland, Edward Bertram,	Amherst,	28 North Prospect Street.	
M.Sc., Massachusetts Agricultural College,	1892.		
McLaine, Leonard Septimus,	New York, N. Y.,	-	-
B.Sc., Massachusetts Agricultural College,	1910.		
Merrill, Joseph Henry,	Danvers,	-	-
B.Sc., Dartmouth College,	1905.		
Regan, William Swift,	Northampton,	-	-
B.Sc., Massachusetts Agricultural College,	1903.		
Shaw, Jacob Kingsley,	Amherst,	1 Allen Street.	
B.Sc., University of Vermont, 1899; M.S.,	Massachusetts Agricultural College,	1908.	
Smith, Philip Henry,	Amherst,	102 Main Street.	
B.Sc., Massachusetts Agricultural College,	1897.		
Smulyan, Marcus Thomas,	Amherst,	-	-
B.Sc., Massachusetts Agricultural College,	1909.		
Summers, John Nicholas,	Campello,	-	-
B.Sc., Massachusetts Agricultural College,	1907.		
Thomas, Frank Lincoln,	Athol,	-	-
B.Sc., Massachusetts Agricultural College,	1910.		
Waters, Theodore Charles,	Rocky Hill, Conn.,	-	-
B.Sc., Massachusetts Agricultural College,	1909.		

GRADUATE STUDENTS. — NOT CANDIDATES FOR A DEGREE.

Greenfield, Melvin Leroy,	Durhamville, N. Y.,	1 Allen Street.
A.B., Colgate,	1908.	
Lawton, Ruth White,	Longmeadow,	Longmeadow.
A.B., Vassar College,	1910.	

Total, 15.

SENIOR CLASS.

Adams, James Fowler, ¹	Melrose,	11 South College.
Allen, Park West,	Westfield,	18 South College.
Baker, Herbert Jonathan,	Selbyville, Del.,	15 North College.
Barrows, Raymond Corbin,	Stafford Springs, Conn.,	5 South College.
Bentley, Arnold Gordon, ¹	Hyde Park,	4 South College.
Blaney, Herbert Wardwell,	Swampscott,	C. S. C. House.
Brown, Edgar Morton,	Merrick,	Theta Phi House.
Burnham, Arthur James, ¹	Holyoke,	75 Pleasant Street.
Bursley, Allyn Parker,	West Barnstable,	Theta Phi House.
Conant, Arthur Theodore,	Sunderland,	7 North College.
Damon, Charles Murray, ¹	Haydenville,	20 South College.
Davis, Egbert Norton,	South Framingham,	7 North College.
Davis, Irving Wilder,	Lowell,	Insectary, M. A. C.
Drury, Harold Blake,	Athol,	6 North College.

¹ Work incomplete.

Dudley, John Edward, Jr., ¹	Newton Center, . . .	11 North College.
Gilgore, Irving Craig, . . .	Central Square, N. Y., . . .	4 South College.
Hill, Nathaniel Herbert, ¹ . . .	Princeton, N. J., . . .	17 South College.
Howe, Harold Hosmer, ¹ . . .	Springfield, . . .	Wilder Hall, M. A. C.
Jenks, Albert Roscoe, ¹ . . .	Three Rivers, . . .	Plant House, M. A. C.
Johnson, Leonard Matthews, ¹	Easthampton, . . .	6 South College.
Labouteley, Gaston E., . . .	Lynn, . . .	Plant House, M. A. C.
Larrabee, Edward Arthur, . . .	Winthrop, . . .	Clark Hall, M. A. C.
Lull, Robert Delano, . . .	Windsor, Vt., . . .	9 Fearing Street.
McGraw, Frank Dobson, ¹ . . .	Fall River, . . .	C. S. C. House.
McLaughlin, Frederick Adams, . . .	Lee, . . .	15 North College.
Morse, Henry Bowditch, ¹ . . .	Salem, . . .	75 Pleasant Street.
Nagai, Isaburo, . . .	Tokyo, Japan, . . .	10 North College.
Nickerson, George Payne, . . .	Amherst, . . .	17 South College.
Nielsen, Gustaf Arnold, ¹ . . .	West Newton, . . .	C. S. C. House.
Ostrolenk, Bernhard, . . .	Gloversville, N. Y., . . .	12 North College.
Parsons, Samuel Raynolds, . . .	North Amherst, . . .	North Amherst.
Patch, Roland Harrison, . . .	Wenham, . . .	4 North College.
Pauly, Herman Alfred, . . .	Plainfield, Vt., . . .	14 North College.
Pickard, Percy William, . . .	Hopedale, . . .	5 South College.
Piper, Ralph Waldo, . . .	South Acton, . . .	12 South College.
Prouty, Frank Alvin, ¹ . . .	Worcester, . . .	9 South College.
Prouty, Philip Herman, . . .	Shrewsbury, . . .	West Experiment Station.
Racicot, Philias Armand, . . .	Lowell, . . .	16 South College.
Robinson, Ralph Cushing, . . .	Boston, . . .	9 South College.
Sharpe, Arthur Harris, ¹ . . .	Saxonville, . . .	2 South College.
Smith, Clarence Albert, . . .	Northampton, . . .	12 South College.
Smith, Raymond Goodale, ¹ . . .	Lynn, . . .	3 Fearing Street.
Stevenson, Lomas Oswald, . . .	Hackensack, N. J., . . .	87 Pleasant Street.
Warren, Edward Irving, ¹ . . .	Leicester, . . .	16 South College.
Whitney, Raymond Lee, . . .	Brookton, . . .	6 Maple Avenue.
Willard, Harold F., . . .	Leominster, . . .	18 South College.
Winn, Ervin Lawrence, . . .	Holden, . . .	87 Pleasant Street.

Total, 47.

JUNIOR CLASS.

Ackerman, Arthur John, ¹ . . .	Worcester, . . .	7 South College.
Beals, Carlos Loring, . . .	Sunderland, . . .	Chemical Laboratory.
Beers, Rowland Trowbridge, ¹ . . .	Billerica, . . .	20 South College.
Bent, William Richard, . . .	Marlborough, . . .	2 North College.
Bodfish, Edward Hill, . . .	West Barnstable, . . .	6 Phillips Street.
Boland, Eric Nichols, . . .	South Boston, . . .	13 Fearing Street.
Brett, Alden Chase, ¹ . . .	North Abington, . . .	2 South College.
Brown, Merle Raymond, . . .	Greenwich Village, . . .	92 Main Street.
Burr, Frederick Huntington, ¹ . . .	Worthington, . . .	16 North College.
Caldwell, Lawrence Sanborn, ¹ . . .	Lynnfield Center, . . .	5 North College.
Carpenter, Jesse, Jr., ¹ . . .	Attleborough, . . .	9 North College.
Castle, Fred Arlo, . . .	Kansas City, Mo., . . .	13 South College.
Clapp, Raymond Kingsley, . . .	Westhampton, . . .	16 North College.
Curran, Daniel Joseph, . . .	Marlborough, . . .	Lover's Lane.
Dee, John Francis, . . .	Worcester, . . .	Lincoln Avenue, at Mrs. Spear's.
Deming, Winfred Griswold, . . .	Wethersfield, Conn., . . .	15 Fearing Street.
Dodge, Albert Wesley, . . .	Wenham, . . .	13 North College.
Eisenhaure, John Louis, ¹ . . .	North Reading, . . .	-
Ells, Gordon Waterman, ¹ . . .	Haverhill, . . .	Walker's House.
Fagerstrom, Leon Emanuel, ¹ . . .	Worcester, . . .	1 North College.
Fisherdieck, Warren Francis, . . .	Amherst, . . .	26 South Pleasant Street.
Fitts, Frank Orus, ¹ . . .	North Amherst, . . .	R. J. Goldberg's.
Fitzgerald, John Joseph, . . .	Holyoke, . . .	33 Elm Street, Holyoke.
Fowler, George Scott, ¹ . . .	Wayland, . . .	44 Pleasant Street.
Frost, John Newton, ¹ . . .	Natick, . . .	77 Pleasant Street.

¹ Work incomplete.

Gallagher, James Andrew, . . .	North Wilmington, . . .	25 Lincoln Avenue.
Gaskill, Lewis Warren, . . .	Hopedale, . . .	Experiment Station.
Gelinas, Louis Edmond, ¹ . . .	North Adams, . . .	14 North College.
Gibbs, Robert Morey, . . .	Chester, . . .	Walker Hall.
Gibson, Lester Earl, ¹ . . .	Melrose, . . .	6 Maple Avenue.
Gray, Frank Leonard, . . .	East Boston, . . .	21 Fearing Street.
Hallowell, Royal Norton, . . .	Jamaica Plain, . . .	Mathematical Building.
Hamblin, Stephen Francis, . . .	Marston Mills, . . .	44 Triangle Street.
Hammond, Arthur Augustus, ¹ . . .	Wallingford, Conn., . . .	Phi Gamma Delta House.
Harlow, Joseph Alvin, . . .	Turners Falls, . . .	5 North College.
Heald, Jay Morrill, . . .	Watertown, . . .	2 North College.
Hemenway, Thomas, . . .	Winchester, . . .	West Experiment Station.
Hickey, Francis Benedict, . . .	Brockton, . . .	C. S. C. House.
Hills, Frank Burrows, . . .	Bernardston, . . .	8 South College.
Holland, Henry Lucius, . . .	Amherst, . . .	28 North Prospect Street.
Hutchings, Herbert Colby, ¹ . . .	South Amherst, . . .	13 North College.
Kingsbury, Arthur French, . . .	Medfield, . . .	Chemical Laboratory.
Lamson, Robert Ward, . . .	Amherst, . . .	51 Pleasant Street.
Lin, Dau Yang, . . .	Shanghai, China, . . .	21 Fearing Street.
Lodge, Charles Albert, ¹ . . .	Manchester, . . .	85 Pleasant Street.
Lloyd, Edward Russell, ¹ . . .	Boston, . . .	25 Lincoln Avenue.
Madison, Francis Spink, . . .	East Greenwich, R. I., . . .	Veterinary Laboratory.
Martin, James Francis, . . .	Amherst, . . .	19 South East Street.
McGarr, Thomas Anthony, ¹ . . .	Worcester, . . .	3 North College.
Merkle, George Edward, ¹ . . .	Amherst, . . .	East Street.
Merrill, Fred Sawyer, . . .	Danvers, . . .	85 Pleasant Street.
Moreau, Theodore Joseph, . . .	Turners Falls, . . .	10 South College.
Müller, Alfred Frederick, ¹ . . .	Jamaica Plain, . . .	3 North College.
Noyes, Harry Alfred, . . .	Marlborough, . . .	Chemical Laboratory.
O'Flynn, George Bernhard, ¹ . . .	Worcester, . . .	75 Pleasant Street.
Parker, Ralph Robinson, . . .	Malden, . . .	C. S. C. House.
Pearson, Charles Cornish, . . .	Arlington, . . .	14 South College.
Peckham, Curtis, . . .	Clifford, . . .	C. S. C. House.
Philbrick, William Edwin, . . .	Taunton, . . .	14 South College.
Pierpont, John Edward, . . .	Williamsburg, . . .	C. S. C. House.
Pratt, Marshall Cotting, . . .	Holderness, N. H., . . .	Kappa Sigma House.
Puffer, Stephen Perry, . . .	North Amherst, . . .	North Amherst.
Raymond, Arthur Nathaniel, . . .	Leominster, . . .	79 Pleasant Street.
Reed, Robert Edward, ¹ . . .	Abington, . . .	Theta Phi House.
Robinson, Earle Johnson, ¹ . . .	Hingham, . . .	8 South College.
Rockwood, Lawrence Peck, . . .	Waterbury, Conn., . . .	116 Pleasant Street.
Sanctuary, William Crocker, . . .	Amherst, . . .	Mill Valley.
Sellew, Lewis Raymond, . . .	Natick, . . .	Brooks Farm.
Shaw, Ezra Ingram, . . .	Amherst, . . .	8 Spaulding Street.
Southwick, Benjamin Gilbert, . . .	Buckland, . . .	8 North College.
Stack, Herbert James, . . .	Conway, . . .	Plant House.
Terry, Leon, . . .	Springfield, . . .	8 Walnut Street.
Torrey, Ray Ethan, . . .	North Leverett, . . .	East Pleasant Street.
Tower, Daniel Gordon, . . .	Roxbury, . . .	15 South College.
Tupper, George Wilbur, ¹ . . .	Jamaica Plain, . . .	85 Pleasant Street.
Turner, Howard Archibald, . . .	Dorchester, . . .	Plant House.
Wales, Robert Webster, . . .	North Abington, . . .	Kappa Sigma House.
Walker, Herman Chester, ¹ . . .	Marlborough, . . .	Walker Hall.
Warner, Roger Andrew, ¹ . . .	Sunderland, . . .	4 North College.
Weaver, William Jack, . . .	Alandar, . . .	10 Allen Street.
Whitney, Charles Everett, . . .	Wakefield, . . .	Walker's Hall.
Wilbur, Emory Sherman, . . .	East Wareham, . . .	Plant House.
Wilde, Earle Irving, . . .	Taunton, . . .	9 North College.
Williams, Edward Roger, ¹ . . .	Concord, . . .	1 North College.
Williams, Silas, . . .	Fall River, . . .	Theta Phi House.
Wood, Howard Holmes, ¹ . . .	Shelburne Falls, . . .	15 South College.
Young, Edwin Burnham, ¹ . . .	Dorchester, . . .	8 North College.

Total, 87.

¹ Work incomplete.

SOPHOMORE CLASS.

Adams, Winford Frederic, ¹	East Leverett,	2 Allen Street.
Allen, Harry Willis,	Amherst,	Amherst.
Anderson, Oscar Gustaf,	East Pepperell,	Entomological Laboratory.
Angier, Harris William,	Westborough,	88 Pleasant Street.
Baird, Harry Albert, ¹	Somerville,	Bungalow, Lover's Lane.
Baker, Dean Foster,	New Bedford,	Walker Hall.
Baker, Horace Mitchell,	Selbyville, Del.,	Kappa Sigma House.
Barber, George Ware,	Franklin,	120 Pleasant Street.
Barstow, Harold Dunbar, ¹	Hadley,	84 Pleasant Street.
Birdsall, Webster Jennings, ¹	Otego, N. Y.,	6 Maple Avenue.
Blake, Ralph Cedric, ¹	Wollaston,	President's House, M. A. C.
Borden, Ralph James,	Fall River,	Phillips Street.
Bradley, John Watling, ¹	Groton,	Theta Phi House.
Brewer, Charlesworth Herbert, ¹	Mt. Vernon, N. Y.,	85 Pleasant Street.
Brown, Herbert Augustine,	Saxonville,	79 Pleasant Street.
Bullard, Alvan Henry,	South Framingham,	5 McCellan Street.
Burby, Lawrence Walter, ¹	Chicopee Falls,	Theta Phi House.
Bursley, Harold Barrows,	Peabody,	Theta Phi House.
Caldwell, David Story,	South Byfield,	Brooks Farm.
Carver, John Stuart,	Roslindale,	85 Pleasant Street.
Chun, Woon Young, ¹	Shanghai, China,	90 Pleasant Street.
Clark, Norman Russell,	Worcester,	College Store.
Clegg, Frank Jackson,	Fall River,	C. S. C. House.
Cobb, Joseph Boyd, ¹	Chicopee Falls,	84 Pleasant Street.
Cole, Arlin Tower, ¹	West Chesterfield,	44 Triangle Street.
Cole, Flora Atwood,	Watertown,	Draper Hall.
Coleman, Isaac, ¹	Amherst,	12 North College.
Cooper, Everett Hanson,	Greenwood,	Walker Hall.
Cory, Harold,	Rutherford, N. J.,	82 Pleasant Street.
Covill, Joseph Warren, ¹	West Roxbury,	7 South College.
Cristman, Clyde Edward,	Dalton,	44 Triangle Street.
Curtis, Harold William,	Belchertown,	Belchertown.
Dayton, James Wilson,	South Norwalk, Conn.,	25 College Street.
Dooley, Thomas Patrick,	South Boston,	35 East Pleasant Street.
Drury, Lewis Floyd,	Rutland,	120 Pleasant Street.
Edminster, Albert Franklin,	Brooklyn, N. Y.,	Mount Pleasant.
Ellis, Benjamin Ward,	Plymouth,	Clark Hall.
Fay, Robert Sedgwick,	Monson,	84 Pleasant Street.
Forbush, Wallace Clifford,	Rutland,	R. J. Goldberg's.
French, James Dudley,	Hyde Park,	116 Pleasant Street.
Gaskill, Ralph Hicks,	Amherst,	15 Hallock Street.
Godvin, Thomas Joseph, ¹	Jamaica Plain,	75 Pleasant Street.
Goodnough, Henry Edward, ¹	Wilbraham,	Kappa Sigma House.
Gore, Harold Martin,	Wollaston,	11 South College.
Greenleaf, George Freeman, ¹	Brockton,	21 Fearing Street.
Griffin, William Gerald,	South Hadley Falls,	35 East Pleasant Street.
Griggs, Frederick David,	Chicopee Falls,	84 Pleasant Street.
Guild, Louis Franklin, ¹	Swanton, Vt.,	Thompson House.
Harris, Burton Adams, ¹	Wethersfield, Conn.,	66 Pleasant Street.
Hasey, Willard Harrison,	Brockton,	C. S. C. House.
Hatch, Herbert Tilden,	Norwell,	East Experiment Station.
Hayden, William Vassall, ¹	Beverly,	Walker Hall.
Headle, Herbert Wallace,	Bolton,	Mrs. L. H. Taylor's.
Headle, Marshall,	Bolton,	Mr. Lewis Howard's.
Holden, James Loomis,	Palmer,	5 McCellan Street.
Howe, Glover Elbridge,	Marlborough,	11 North College.
Howe, Ralph Wesley,	East Dover, Vt.,	116 Pleasant Street.
Hubert, Benjamin Franklin,	White Plains, Ga.,	48 Mount Pleasant Street.
Huntington, Samuel Percy,	Lynn,	Kappa Sigma House.

¹ Work incomplete.

Hutchison, Robert B., ¹	Somerville, ...	11 Phillips Street.
Hyland, Harold Wilson, ¹	Weymouth, ...	Kappa Sigma House.
Jenney, Herbert Hedge, .	South Boston, ...	116 Pleasant Street.
Jones, Harold Frederick, .	Campello, ...	120 Pleasant Street.
Jordan, Simon Miller, .	Rutherford, N. J., . .	Walker's House.
Kelley, Albert Joseph, .	Roxbury, ...	75 Pleasant Street.
Kelley, Bernard Jenkins, .	Harwich, ...	116 Pleasant Street.
Kenney, Frederick Alfred, .	Charlestown, ...	77 Pleasant Street.
Lake, James Edward, .	Fall River, ...	5 McCellan Street.
Lane, William Francis, .	Leominster, ...	Phillips Street.
Larsen, Nils Paul, .	Bridgeport, Conn., .	Clark Hall.
Lesure, John Warren Thos.,	Lunenburg, ...	94 Pleasant Street.
Little, Willard Stone, .	Newburyport, ...	120 Pleasant Street.
Lowry, Quincy Shaw, ¹ .	Canton, ...	Kappa Sigma House.
Lyon, Harold, .	Somerville, ...	116 Pleasant Street.
Maccone, Joseph Augustine, ¹	Concord, ...	116 Pleasant Street.
Mallett, George Alfred, .	Bridgeport, Conn., .	Walker Hall.
Marsh, Frank Eugene, ¹ .	Jefferson, ...	Experiment Station Barn.
Matz, Julius, ¹ .	Boston, ...	112 Pleasant Street.
Mayer, John Lawrence, .	South Boston, ...	35 East Pleasant Street.
McDougall, Allister Francis,	Westford, ...	Brooks Farm.
Moir, William Stuart, .	Boston, ...	35 North Prospect Street.
Murray, Joseph Wilbur, .	Holyoke, ...	75 Pleasant Street.
Neal, Ralph Thomas, .	Mattapan, ...	120 Pleasant Street.
Nichols, Norman Joseph, .	Everett, ...	Mrs. L. H. Taylor's.
O'Brien, James Leo, .	Wayland, ...	The Bungalow, Lover's Lane.
Packard, Clyde Monroe, .	Springfield, ...	96 Pleasant Street.
Parsons, Robert, .	Lynn, ...	44 Triangle Street.
Pease, Lester Newton, .	Meriden, Conn., .	84 Pleasant Street.
Pellett, John Doubleday, ¹	Worcester, ...	20 North College.
Pillsbury, Joseph James, ¹	West Bridgewater, .	8 South Prospect Street.
Post, George Atwell, ¹ .	Richmond Hill, N. Y.,	Theta Phi House.
Prouty, Roy Henry, ¹ .	Worcester, ...	Walsh's House.
Putnam, Earl Francis, ¹ .	Easthampton, ...	5 McCellan Street.
Roberts, Clarence Dwight, ¹	New Haven, Conn., .	10 Allen Street.
Roehrs, Herman Theodore, .	New York, N. Y., .	83 Pleasant Street.
Rosebrooks, Walter Edwin, .	Millbury, ...	Care of Mrs. Tripp, East Pleasant Street.
Samson, Stuart Dodge, .	Grand Isle, Vt., .	Kappa Sigma House.
Selden, John Lincoln, ¹ .	Northampton, ...	3 McCellan Street.
Serex, Paul, Jr., .	Jamaica Plain, ...	75 Pleasant Street.
Sheehan, Dennis Anthony, .	South Lincoln, ...	Walker Hall.
Shute, Carl August, ¹ .	Hampden, ...	120 Pleasant Street.
Streeter, Charles Marsh, .	Brimfield, ...	R. J. Goldberg's.
Thayer, Clark Leonard, .	Enfield, ...	77 Pleasant Street.
Tucker, Waldo Guy, .	Lynn, ...	19 Pleasant Street.
Tupper, Arthur Somerville, .	Roxbury, ...	85 Pleasant Street.
Van Zwaluwenburg, Reyer Herman,	Rutherford, N. J., .	East Experiment Station.
Walker, Charles Dexter, ¹	Greenwich Village, .	120 Pleasant Street.
Wells, Nathan Holmes, ¹ .	Kennebunk, Me., .	Care of Mrs. E. W. Smith, North Prospect Street.
Whitney, Francis Wellington,	Needham, ...	15 Hallock Street.
Zabriskie, George, 2d, .	Rutherford, N. J., .	Pleasant Street.

Total, 110.

FRESHMAN CLASS.

Abbott, Leslie Elmer, . . .	Sandwich, ...	Brooks Farm.
Allbee, Gerard Osias, . . .	Medway, ...	Mount Pleasant, care of Ora Samuel Gray.
Allen, Carl Murdough, . . .	Holyoke, ...	3 Fearing Street.
Anapolsky, Morris, ...	Boston, ...	8 Walnut Street.

¹ Work incomplete.

Anderson, Leslie Oscar, . . .	Concord, . . .	55 Pleasant Street.
Baker, Melville, . . .	West Medford, . . .	Campion's, Pleasant Street.
Besser, Sidney Stokes, . . .	Gilbertville, . . .	Brooks Farm.
Bickford, Horace Mann, . . .	East Braintree, . . .	116 Pleasant Street.
Bittinger, Fritz John, . . .	Plymouth, . . .	120 Pleasant Street.
Blackhall, Allan John, . . .	Brookline, . . .	17 Fearing Street.
Bokelund, Chester, . . .	Worcester, . . .	31 East Pleasant Street.
Bragg, Ralph Stanley, . . .	Milford, . . .	Mount Pleasant.
Brewer, Harold William, . . .	Mount Vernon, N. Y., . . .	Care of Mrs. Dyer, Phillips Street.
Brooks, Arthur Winslow, . . .	New Bedford, . . .	Brooks Farm.
Brown, Harry Dunlap, . . .	Lowell, . . .	82 Pleasant Street.
Caldwell, Delmont Leo, . . .	Dorchester, . . .	6 Nutting Avenue.
Calvert, Melville Bradford, . . .	New London, Conn., . . .	58 Pleasant Street.
Chapon, Robert Henri, . . .	Bangor, Me., . . .	83 Pleasant Street.
Christie, Edward Wheeler, . . .	North Adams, . . .	29 Lincoln Avenue.
Clark, Ernest Samuel, Jr., . . .	Tolland, . . .	96 Pleasant Street.
Clay, Harold Johnson, . . .	Cambridge, . . .	21 Fearing Street.
Coe, Alfred Lynn, . . .	New York, N. Y., . . .	Mrs. L. H. Taylor's, North Amherst.
Cole, Herbert Elmer, . . .	Three Rivers, . . .	120 Pleasant Street.
Coleman, David Augustus, . . .	South Framingham, . . .	29 McCellan Street.
Culley, Frank Hamilton, . . .	Marshalltown, Ia., . . .	30 North Prospect Street.
Damon, Samuel Reed, . . .	Kingston, R. I., . . .	77 Pleasant Street.
Davies, Lloyd Garrison, . . .	Peabody, . . .	3 McCellan Street.
Davis, Ralph Edward, . . .	Southbury, Conn., . . .	77 Pleasant Street.
Davis, William Ashmun, . . .	Sunderland, . . .	Care of E. H. Forristall.
Dearing, Newton Howard, . . .	Brookline, . . .	11 Cottage Street.
Demand, Robert Norton, . . .	Stafford Springs, Conn., . . .	Care of E. H. Forristall.
Dexter, Evans King, . . .	Mattapoisett, . . .	31 East Pleasant Street.
Dunbar, Erving Walker, . . .	North Weymouth, . . .	5 Sunset Avenue.
Dunne, Robert Ernest, . . .	New York, N. Y., . . .	17 Kellogg Avenue.
Earle, Henry Weston, . . .	Roxbury, . . .	108 Pleasant Street.
Edgerton, Almon Morley, . . .	West Springfield, . . .	Nutting Avenue.
Edmonds, Sidney Wilfred, . . .	Roslindale, . . .	60 Pleasant Street.
Edwards, Edward Clinton, . . .	Salem, . . .	15 Cottage Street.
Elder, William Arthur, . . .	Irvington, N. Y., . . .	56 Pleasant Street.
Eldridge, Harold Lockwood, . . .	Wareham, . . .	M. A. C. Grounds.
Farrar, Stuart Kittredge, . . .	Springfield, . . .	35 East Pleasant Street.
Foster, Stuart Brooks, . . .	West Somerville, . . .	16 Pleasant Street.
Freeborn, Stanley Barron, . . .	Marlborough, . . .	116 Pleasant Street.
Freedman, Samuel Leavitt, . . .	Roxbury, . . .	13 East Pleasant Street.
Frost, Robert Theodore, . . .	New York, N. Y., . . .	Care of Mrs. Dyer, Phillips Street.
Frye, Carl Raymond, . . .	South Hadley Falls, . . .	East Pleasant Street.
Gare, Edward John, . . .	Northampton, . . .	101 Pleasant Street.
Gibson, David Wyman, . . .	Groton, . . .	Care of Mrs. L. H. Taylor's, North Amherst.
Graves, Benjamin Robert, . . .	Northampton, . . .	58 Pleasant Street.
Grebin, Mark Anthony, . . .	North Hadley, . . .	North Hadley.
Hadfield, Harold Frederick, . . .	North Adams, . . .	29 Lincoln Avenue.
Handy, Ralph Ellis, . . .	Cataumet, . . .	Brooks Farm.
Harriman, Vincent Spaulding, . . .	Brockton, . . .	19 Hallock Street.
Harris, Rodney Wells, . . .	Wethersfield, Conn., . . .	66 Pleasant Street.
Haskell, Willard Anderson, . . .	Greenfield, . . .	Pleasant Street.
Hazen, Edward Leonard, . . .	Springfield, . . .	Care of E. H. Forristall.
Hebard, Emory Blodgett, . . .	Southbridge, . . .	3 Fearing streets.
Heffron, Fred, . . .	Sherborn, . . .	47 Pleasant Street.
Higgins, Edward William, . . .	Arlington, . . .	79 Pleasant Street.
Hogg, Lawrence Jagger, . . .	Lawrence, . . .	9 Phillips Street.
Howard, Louis Phillips, . . .	North Easton, . . .	82 Pleasant Street.
Hutchinson, John Gouvernour, . . .	Arlington, . . .	79 Pleasant Street.
Hutchinson, Raymond Ernest, . . .	South Hanson, . . .	52 Pleasant Street.

Ingham, Earl Morris, . . .	Granby, . . .	6 Nutting Avenue.
Jacobs, Loring Humphrey, . . .	Wellesley, . . .	9 Fearing Street.
Jewett, Henry Dana, . . .	West Newton, . . .	Pleasant and Fearing Streets.
Johnson, Bernhard Pol, . . .	Boston, . . .	Walker's House.
Johnson, Rollin Eugene, . . .	Templeton, . . .	14 Kellogg Avenue.
Jones, Dettmar Wentworth, . . .	Melrose, . . .	Care of Mrs. Dyer, Phillips Street.
Keyes, Pearl Pease, . . .	North Amherst, . . .	North Amherst.
Kilbourn, Walter Goss, . . .	South Lancaster, . . .	82 Pleasant Street.
Kriebel, Addison Reiff, . . .	Norristown, Pa., . . .	Thompson House.
Leach, Benjamin Robert, . . .	Methuen, . . .	79 Pleasant Street.
Leete, Richard Fowler, . . .	Mount Kisco, N. Y., . . .	79 Pleasant Street.
Lemoine, Albert Zepherin, . . .	South Framingham, . . .	-
Levine, Henry Walter, . . .	Roxbury, . . .	13 East Pleasant Street.
Lewis, John Kirby, . . .	New Haven, Conn., . . .	58 Pleasant Street.
Lincoln, Murray Danforth, . . .	North Raynham, . . .	82 Pleasant Street.
Lucas, Hoyt Dennis, . . .	West Springfield, . . .	6 Nutting Avenue.
MacDonald, Daniel Alfred, . . .	Walpole, . . .	79 Pleasant Street.
MacHale, William Edward, . . .	Jamaica Plain, . . .	-
Mahan, Harold Butteworth, . . .	Hingham, . . .	3 McCellan Street.
Major, Joseph, . . .	Rutherford, N. J., . . .	58 Pleasant Street.
McNiff, Owen Augustine, . . .	Harvard, . . .	52 Pleasant Street.
Melloon, Ralph Reid, . . .	Lowell, . . .	Mount Pleasant.
Merkle, Frederick Grover, . . .	Amherst, . . .	East Street.
Morrison, Harold Ivory, . . .	Melrose, . . .	66 Pleasant Street.
Morse, Harold John, . . .	Townsend, . . .	Brooks Farm.
Munroe, Donald Mitchell, . . .	Huntington, N. Y., . . .	101 Pleasant Street.
Murray, John Kane, . . .	Winthrop, . . .	14 Kellogg Avenue.
Needham, Lester Ward, . . .	Springfield, . . .	Care of E. H. Forristall.
Nicolet, Tell William, . . .	Fall River, . . .	17 Fearing Street.
Nicolet, Theodore Arthur, . . .	Fall River, . . .	17 Fearing Street.
Nicoll, William, . . .	Glen Cove, N. Y., . . .	101 Pleasant Street.
Nissen, Harry, . . .	Roslindale, . . .	13 Fearing Street.
Norton, Leslie Howard, . . .	Brockton, . . .	19 Hallock Street.
Oertel, John Thomas, . . .	South Hadley Falls, . . .	Walker Hall.
Palmer, John Philip, . . .	Portsmouth, N. H., . . .	79 Pleasant Street.
Parker, Edwin Kenney, . . .	Northampton, . . .	5 McCellan Street.
Parker, Ervine Franklin, . . .	Poquonock, Conn., . . .	96 Pleasant Street.
Payne, Roland Alfred, . . .	Wakefield, . . .	North Amherst.
Peters, Chester Harry, . . .	Brown Station, N. Y., . . .	11 Cottage Street.
Petersen, Peverill Oscar, . . .	Concord, . . .	55 Pleasant Street.
Pigott, Edgar Royston, . . .	Winthrop, . . .	14 Kellogg Avenue.
Porter, Bennett Allen, . . .	Amherst, . . .	R. D. 1, No. 25, Amherst.
Powers, Richard Henry, . . .	Malden, . . .	Walker Hall.
Presley, Fred Young, . . .	Malden, . . .	Pleasant Street.
Priest, Roger Alexander, . . .	Littleton, . . .	15 Fearing Street.
Read, Frederick William, . . .	Boston, . . .	75 Pleasant Street.
Rees, Harry Launcelot, . . .	Monson, . . .	3 Fearing Street.
Reid, George Alexander, . . .	Worcester, . . .	58 Pleasant Street.
Robinson, Herbert Calvin, . . .	Haverhill, . . .	Walker Hall.
Russell, Alden Hesseltine, . . .	Watertown, . . .	16 Pleasant Street.
Sahr, Gabriel Arthur, . . .	Boston, . . .	30 North Prospect Street.
Sanford, Clarence Higgins, . . .	Allston, . . .	3 Fearing Street.
Sexton, George Patrick, . . .	Allston, . . .	Brooks Farm.
Shaylor, Fred Wright, . . .	Lee, . . .	120 Pleasant Street.
Sherman, Joel Powers, . . .	Hyannis, . . .	Walker Hall.
Sherman, Milton Francis, . . .	South Lincoln, . . .	17 Kellogg Avenue.
Shirley, John Newton, . . .	South Duxbury, . . .	30 North Prospect Street.
Simmons, George Walker, . . .	Boston, . . .	116 Pleasant Street.
Slein, Owen Francis, . . .	New Braintree, . . .	Brooks Farm.
Small, Francis Willard, . . .	North Truro, . . .	12 Hallock Street.
Smart, Herbert Leighton, . . .	Framingham, . . .	15 Hallock Street.
Smith, Leone Ernest, . . .	Leominster, . . .	44 Pleasant Street.
Smith, Leon Edgar, . . .	Brighton, . . .	13 Fearing Street.

Spencer, Ray Silsby, . . .	West Burke, Vt., . . .	79 Pleasant Street.
Stevens, Arthur Eben, . . .	Brockton, . . .	109 Main Street.
Stewart, George Osborn, . . .	Somerville, . . .	79 Pleasant Street.
Strange, Sarah Josephine, . . .	Marshfield, . . .	Draper Hall.
Taft, Carl Mather, . . .	Mendon, . . .	15 Hallock Street.
Taft, Richard Craig, . . .	Oxford, . . .	75 North Pleasant Street.
Talbot, Rolfe Henry, . . .	Brockton, . . .	5 McCellan Street.
Tarbell, Munroe Gifford, . . .	Brimfield, . . .	R. J. Goldberg's.
Taylor, Arthur Wright, . . .	Feeding Hills, . . .	Nutting Avenue.
Taylor, Leland Hart, . . .	Peabody, . . .	3 McCellan Street.
Thurston, Arthur Searle, . . .	Everett, . . .	9 Fearing Street.
Tower, Alfred Leigh, . . .	Sheffield, . . .	North Pleasant Street.
Tsang, Oong Hyuen, . . .	Shanghai, China, . . .	26 Lincoln Avenue.
Upton, Ernest Franklin, . . .	Salem, . . .	15 Cottage Street.
Walker, Nathaniel Kennard, . . .	Malden, . . .	83 North Pleasant Street.
Walker, Raymond Philip, . . .	Taunton, . . .	120 Pleasant Street.
Ward, Talbot, . . .	Hyde Park, . . .	11 Cottage Street.
Warner, Raymond Winslow, . . .	Sunderland, . . .	Care of E. H. Forristall.
Webster, Louis Armstrong, . . .	Blackstone, . . .	15 Hallock Street.
Weigel, Arthur George, . . .	Lawrence, . . .	79 Pleasant Street.
Wheeler, Chester Eaton, . . .	Lowell, . . .	79 Pleasant Street.
Wheeler, Warren Gage, . . .	Dedham, . . .	56 Pleasant Street.
Whidden, Burton Clark, . . .	Waltham, . . .	79 Pleasant Street.
Whippen, Charles Warren, . . .	Lynn, . . .	79 Pleasant Street.
White, Samuel Alexander, . . .	Boston, . . .	19 Fearing Street.
Whorf, Paul Francis, . . .	Dorchester, . . .	Brooks Farm.
Williams, George Edmund, . . .	Belchertown, . . .	Belchertown.
Wing, John Govan, . . .	Somerville, . . .	Brooks Farm.
Wood, Henry Joseph, . . .	Mendon, . . .	15 Hallock Street.
Wooley, Harold Curtis, . . .	Malden, . . .	83 Pleasant Street.
Wright, Frank Vernon, . . .	Salem, . . .	79 Pleasant Street.
Young, Royal Bosworth, Jr., . . .	Roxbury, . . .	108 Pleasant Street.

Total, 160.

UNCLASSIFIED STUDENTS. — NOT CANDIDATES FOR A DEGREE.

Churchill, George Clarence, . . .	Worcester, . . .	15 Boston Street.
Critchett, Edward Russell, . . .	Watertown, . . .	Mount Pleasant.
DeMott, Henry Vroom, . . .	Metuchen, N. J., . . .	2 Allen Street.
Eager, Samuel Warner, . . .	Deerfield, . . .	120 Pleasant Street.
Edwards, Charles Richmond, . . .	Northampton, . . .	-
Gilmore, Howard Pool, . . .	Waban, . . .	3 Allen Street.
Granger, Helen, . . .	Amherst, . . .	Draper Hall.
Greene, William Allan, . . .	Elmwood, . . .	Mount Pleasant.
Hall, Horace Whitney, . . .	Newton Center, . . .	Pleasant Street.
Leonard, Larnie, . . .	Talladega, Ala., . . .	48 Pleasant Street.
Lynch, Frank John, . . .	Holyoke, . . .	75 Pleasant Street.
O'Brien, Daniel William, . . .	Wayland, . . .	Lover's Lane.
Phelps, Benjamin Austin, Jr., . . .	Northampton, . . .	79 Pleasant Street.
Reed, Waldo Burt, . . .	Springfield, . . .	11 Boston Street.
Selkregg, Edwin Reimund, . . .	North East, Pa., . . .	17 Fearing Street.
Sibley, Milton Lawrence, . . .	Worcester, . . .	-
Sohier, Fred Martin, . . .	Concord, . . .	26 McCellan Street.

Total, 17.

SUMMARY BY CLASSES.

Graduate students, ...	15
Senior class, ...	47
Junior class, ...	87
Sophomore class, ...	110
Freshman class, ...	158
Unclassified, ...	17
	419
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Connecticut, ...	17
New York, ...	18
New Jersey, ...	7
Rhode Island, ...	2
Maine, ...	2
New Hampshire, ...	3
Vermont, ...	6
Delaware, ...	2
Pennsylvania, ...	2
Georgia, ...	2
Alabama, ...	1
Iowa, ...	1
Missouri, ...	1
China, ...	3
Japan, ...	1
	434

SHORT COURSES.

SHORT COURSES — 1910.

WINTER COURSE STUDENTS.

Alecock, James Richard, North Amherst.
 Baggs, Milton Charles, Belchertown.
 Bahsler, Eugene, Dunstable.
 Barnes, Joseph C., Lanesborough.
 Belknap, Robert Sidney, Amherst.
 Bowditch, John P., Framingham.
 Bowser, Lydia Animia, Cohasset.
 Bradstreet, Albert C., Topsfield.
 Canlett, Thomas Griffith, Rockport.
 Clark, Emerson Leland, Milford, Conn.
 Channing, Hayden, Sherborn.
 Childs, Samuel Wellington, Deerfield.
 Cordes, Edward, Great Barrington.
 Cox, Harold Childs, Wakefield.
 Curtis, Elliot D., Bantam, Conn.
 Day, Harry Ney, West Stockbridge.
 Dow, Aaron William, Bolton.
 Dunn, Howard Waterman, Dorchester.
 Eastwood, John Robert, North Adams.
 Edmands, Thomas Roland, Newton.
 Gage, Earl Lyman, Gilbertville, N. Y.
 Gray, George Arthur, Beverly.
 Harris, George Browning, North Adams.
 Holcomb, Edmund Alfred, Simsbury, Conn.
 Hurd, Robert Otis, Westminster.
 Kenney, Ralph Hewes, Greenwich, N. Y.
 Ketchen, Harold Barnett, Belchertown.
 Killam, John, East Boxford.
 Koch, Mrs., Mabel Tyler, Bloomfield, Conn.
 Lanier, Sidney, Walpole.
 Lemoine, Arthur Alfred, South Framingham.
 Lewis, Albert, East Rockaway, N. Y.
 Marsh, Howard Clifton, Arlington.

Maurer, Frank Julius, Newton.
 McCarroll, Edward Loomis, Waban.
 McIntyre, George Henderson, Easthampton.
 O'Donnell, James Curran, Belchertown.
 Pardee, Edwin Curtis, Bolton.
 Pease, Willard Morris, Monson.
 Peck, Harold Frederick, Belchertown.
 Perham, John Franklin, Ludlow Center.
 Priest, Frederick Stimpson, Watertown.
 Puffer, Willis Reynolds, Concord.
 Sabine, George Kraus, Jr., Brookline.
 Sanderson, Leon Benjamin, Williamsburg.
 Scaee, William, Pittsfield.
 Scott, Edwin Gould, Garfield, Wash.
 Searle, Edward, Southampton.
 Seaver, John Dwight, New Britain, Conn.
 Selkregg, Edwin Reimund, North East, Pa.
 Shaughnessy, Thomas Francis, Marlborough.
 Smith, John Anderson, South Westport.
 Smith, Ralph Gibbs, North Amherst.
 Supple, Mark Wellman, South Deerfield.
 Thompson, Paul Ellis, Brookline.
 Torrey, Lewis Edwin, Southbridge.
 Urann, Carl B., Sullivan, Me.
 Valentine, Francis Wadsworth, Boston.
 Valentine, Richard Kirk, Erie, Pa.
 Vetter, Rudolf, North Andover.
 Walker, Elbert Lionel, Savoy Center.
 Walker, Rena Lillis, Savoy Center.
 Warfield, Preston George, Buckland.
 Wheeler, George Oscar, Hudson.
 Young, Earl Leonard, South Hadley.

Total, 65.

POULTRY KEEPERS' COURSE.

Barnes, Joseph C., Lanesborough.
 Barnes, J. Edward, Athol.
 Bradley, Miss A. J., Boston.
 Chapin, E. C., Holyoke.
 Chase, L. B., Sunderland.
 Childs, Irving H., Deerfield.
 Childs, Prentis B., Waltham.
 Clement, Ralph, Richmond.
 Coulson, S., Cambridge.
 Crisand, Carl, Worcester.
 Day, H. I., West Stockbridge.
 Day, Irving N., South Hadley.

Dearden, James, Massachusetts.
 Dixon, Enslo S., Roxbury.
 Follett, Mrs. E. F., Boston.
 Fox, Harry M., Dracut.
 Heard, J. G., Dover.
 Hitchcock, C. N., Amherst.
 Holcomb, E. A., Simsbury, Conn.
 Howards, Mrs. H. J., New York, N. Y.
 Hutchinson, Wm. F., Sutton.
 Johnson, C. W., Southborough.
 Kendall, Mrs. H. I., Hadley.
 Ketchen, Harold B., Belchertown.

Lanier, Sidney, Walpole.
 Lawrence, Susan M., East Northfield.
 Lupien, Israel A., Barre.
 Martin, Henry L., Marblehead.
 Mendum, S. W., Amherst.
 Merrian, Etta L., East Northfield.
 Merrick, Dr. Sara N., Cambridge.
 Newton, Ward H., Athol.
 Osgood, Champion, Cohasset.
 Paine, Ralph D., Ludlow.
 Perry, Lawrence, Hingham.
 Terry, Leon, Springfield.
 Priest, Frederick, Watertown.
 Robinson, G. F., Somerville.

Sanderson, Leon B., Williamsburg.
 Sias, Arthur E., East Boston.
 Snell, Lewis P., Greenwich, N. Y.
 Soderborn, G. O., New Bedford.
 Stearns, John Warren, Sharon.
 Thomas, Alfred C., Lawrence.
 Tower, Eva L., Northfield.
 Vetter, Rudolf, North Andover.
 Walker, Elbert L., Savoy Center.
 Whaley, James Sidney, East Orange, N. J.
 Whitcomb, R. H., Amherst.
 Whitney, J. C., Newbury.
 Young, Earl L., South Hadley.

Total, 51.

BEEKEEPERS' COURSE.

Allen, G. H., Amherst.
 Browning, C. P., Orange.
 Burnett, Mrs. Harriet C., Natick.
 Chapin, Annie M., Melrose.
 Fleury, Joseph, Huntington.
 Gowans, Ethel, Hampton, Va.
 Graves, Charles, Haydenville.
 Heath, Mrs. Alice, Auburndale.
 Ives, Henry E., Westhampton.
 Lawrence, Susan M., East Northfield.

Martin, J. O., Wilbraham.
 Martindale, Gerald, Amherst.
 Maud, Lawrence C., Bristol.
 Morse, Josephine, South Lancaster.
 Mulligan, Mrs. Minna, Natick.
 Murch, Mary E., Melrose.
 Schmitz, Eugene, Greenwich, Conn.
 Sherman, Lillian A., Amherst.
 Torrey, E. T., Southbridge.

Total, 19.

SUMMER SCHOOL STUDENTS.

Abercrombie, Rev. R. H., Windsor.
 Adams, Faneuil, Brookline.
 Adams, Lena R., Worcester.
 Adams, Rebecca, Brookline.
 Allen, Mary E., Worcester.
 Allen, Thomas, Belchertown.
 Allis, Abbie L. G., Amherst.
 Ames, Fisher, Brookline.
 Ames, Rosalie, Brookline.
 Ayer, Addie M., Richford, Vt.
 Ayer, Elizabeth P., Newport, R. I.
 Bailey, Ethel M., Lancaster.
 Baker, Florence M., Amherst.
 Ball, Minnie, Amherst.
 Beckwith, Fanny Leigh, Plainfield, N. J.
 Belcher, S. Elizabeth, Worcester.
 Bigelow, Lucy M., Amherst.
 Boinstein, Sarah, New York, N. Y.
 Boinstein, Pauline, New York, N. Y.
 Boyer, M. Elmer, Lynn.
 Brandow, Melvin, Plymouth.
 Brandow, Mrs. Melvin, Plymouth.
 Britt, Emma, South Boston.
 Bromley, Mae H., Dorchester.
 Brooks, Laura J., Stoneham.
 Brown, S. Crissy, Stamford, Conn.
 Burdick, Catharine Stevens, Newport, R. I.
 Burgess, Louisa W., Dorchester Center.
 Burrage, Ruth Kilburn, Medford.
 Butcher, Gertrude, Boston.

Carruth, Frank E., Cohoes, N. Y.
 Chapman, Christine, Springfield.
 Channing, Hayden, Sherborn.
 Charlton, Emanuel C., Heath.
 Chase, Rev. L. B., Sunderland.
 Cheney, Hazel Chase, Amherst.
 Clark, Doris, North Amherst.
 Clark, Katherine, North Amherst.
 Clark, Ruth Zilpha, Amherst.
 Cochrane, A. L., Boston.
 Cole, Albert S., North Dartmouth.
 Cooledge, Kate A., Boston.
 Cota, Florence L., Worcester.
 Cox, Edward J., Newtonville.
 Cox, Eleanor L., Newtonville.
 Cox, Isabella L., Newtonville.
 Cox, John E., Newtonville.
 Crook, Charles M., Saundersville.
 Crooks, Mrs. Charles M., Saundersville.
 Cushman, Elizabeth, Harvard.
 Cushman, Martha A., Harvard.
 Cushman, Esther C., Providence, R. I.
 Daly, Margaret, Brushton, N. Y.
 Damon, E. Farnham, Concord Junction.
 Davies, Rev. D. F., Plainfield.
 Davis, Helen, Amherst.
 Davis, Helen I., Lynn.
 Davis, Lillian E., Boston.
 Davis, Marjorie, Sterling.
 Day, George Willis, Lynn.

- Day, Mrs. George W., Lynn.
 Derrick, Rev. Thomas H., Wellfleet.
 Downing, Florence E., Everett.
 Drinker, Florence L., Brooklyn, N. Y.
 Drinker, Minnie F., Brooklyn, N. Y.
 Eastman, Laura M., Winchendon.
 Edds, Rev. Wm. T., Sag Harbor, N. Y.
 Edwards, Arthur C., Bolton.
 Eltzholtz, John W., Jacksonville, Ill.
 Evans, Mr. E. R., Atlanta, N. Y.
 Fay, Louise, Waltham.
 Firmin, Mrs. M. A., Medford.
 Ford, James, Cambridge.
 Ford, Mrs. James, Cambridge.
 France, William, Duxbury.
 Fruean, Mary A., Dorchester Center.
 Gage, Lucy Helen, West Medford.
 Gardner, Adaline A., East Boston.
 Gifford, Mrs. Alice B., Amherst.
 Goodrich, Martha A., South Boston.
 Goodnow, Edna M., Amherst.
 Gould, Ella F., Brockton.
 Graham, Carrie C., New Haven, Conn.
 Granger, Helen, Amherst.
 Graves, C. Edward, Hatfield.
 Gurney, Florence W., ———.
 Gurney, Ida B., Marion.
 Haffenreffer, August, Jamaica Plain.
 Hall, F. Josephine, Waltham.
 Hall, Ida Estelle, Waltham.
 Harding, Burchan, Mrs., New York
 Hardon, Henry C., Newton.
 Harrington, Clara B., Montague.
 Harris, Mabel Everett, Cambridge.
 Hayward, Lewis F., Holyoke.
 Hawthorne, Elizabeth S., Dorchester.
 Henizen, Henriette M., New York, N. Y.
 Hersey, George Milbank, Boston.
 Hewes, Elizabeth, Cambridge.
 Hogan, Teresa G., Taunton.
 Holbrook, Ella M., Dover.
 Honnay, Agnes, Amherst.
 Honnay, May, Amherst.
 Hough, Helen, Northampton.
 Howard, Clara B., North Amherst.
 Howard, Effie B., North Amherst.
 Howell, Lawrence D., Princeton, N. J.
 Hubbell, George W., Rochester, N. Y.
 Hudson, Cora L., Lock's Village.
 Hurd, Mrs. William D., Amherst.
 Hutchings, Frank F., Amherst.
 Ivey, Rev. John L., Amherst.
 Jenkins, Elizabeth, Northampton.
 Jenks, Chas. F., Canton.
 Jones, Frederick W., Providence, R. I.
 Joplin, Flora Yeaton, Haverhill.
 Joplin, Josephine M., Hampton, N. H.
 Kelley, James P., New York, N. Y.
 Kennedy, H. Anna, South Weymouth.
 King, Emma H., Boston.
 Knightly, Agnes E., Amherst.
 Knight, Albert D., New Boston.
 Knight, Howard Lawton, Washington, D. C.
 Knight, Mrs. Howard Lawton, Washington, D. C.
 Lathuner, Hugh, Stryker, O.
 Lawler, Margaret E., Amherst.
 Learnard, Mrs. Maude B., Newton Center.
 Lindsey, Mrs. J. B., Amherst.
 Loomis, Herbert Norton, New Britain, Conn.
 Lyman, Harriet E., Boston.
 Macmahon, Abbie D., Lyndhurst, N. J.
 Macmahon, Arthur Whittier, Lyndhurst, N. J.
 Macaumber, Clarissa W., Boston.
 March, Mrs. Clara I., Sherborn.
 March, Mrs. Emily M., Arlington.
 Margetts, Rev. H. G., Angelica, N. Y.
 Martin, Elizabeth L., Southbridge.
 Martin, John O., Southbridge.
 Mattson, Mrs. W. F., Brookline.
 Mayo, Stella W., Waltham.
 McAfee, French, Port Royal, Pa.
 McClenaghan, Rev. S. J., Jamesburg, N. J.
 McKnight, Rev. William C., Nottingham, Pa.
 Mellor, William H., Waltham.
 Merrill, Evan W. D., Somerset.
 Merrill, Mrs. Mary E., Somerset.
 Miller, E. Cyrus, Hadenville.
 Milliken, Fanny Lord, Malden.
 Monk, Mrs. H. A., Stoughton.
 Morgan, Edith, Amherst.
 Morrison, Rev. T. Maxwell, Bellona, N. Y.
 Morrison, Mrs. T. Maxwell, Bellona, N. Y.
 Moulton, Ada E., North Hampton, N. H.
 Mudge, Rev. W. L., Lewiston, Pa.
 Murray, Florence H., Cambridge.
 Neal, Josephine B., Taunton.
 Newhall, Laura L., South Boston.
 Nichols, Norman J., North Amherst.
 Nickerson, Frances L., Amherst.
 Norris, Rev. Thomas F., Plympton.
 O'Connor, Mary E., Taunton.
 O'Donnell, Miss N. T., Bridgeton, N. J.
 Page, Effie M., Dorchester Center.
 Page, Florence, Minot.
 Paine, Bernard L., West Barnstable.
 Parris, Mrs. Clara Howland, Dorchester Center.
 Parsons, Elisabeth, Cleveland, O.
 Pierpont, Rev. John, Williamsburg.
 Piper, Elizabeth B., Cambridge.
 Plumb, Sarah H., Amherst.
 Polk, Samuel, Colora, Md.
 Pool, Lena B., Lynn.
 Poore, Harriet P., Boston.
 Poore, Mary E., Brockton.
 Post, Jessie L., Gilead, Conn.
 Pousland, Annie E., Salem.
 Prescott, Carl F., Quiney.
 Quint, Harry, Roxbury.
 Radlo, Dora A., North Adams.
 Reymann, Anna, Cambridge.
 Riggs, Ezra J., North Carver.
 Robinson, Mrs. Alice M., South Boston.
 Robinson, Emma C., Mount Vernon, N. Y.
 Robinson, Mary B., Waltham.
 Roberts, Fanny E., Brooklyn, N. Y.

Robertson, Rev. Wm., Sandwich.
 Rowe, Mildred, Amherst.
 Sanford, Lewis W., Lincoln.
 Sayre, H. Bradley, Geneva, N. Y.
 Schmidt, Richard H., Bridgeport, Conn.
 Seymour, Florence C., Winsted, Conn.
 Seymour, Mary F., Winsted, Conn.
 Scribner, Celia A., Boston.
 Sherman, Lillian A., Amherst.
 Shumway, Ruth, Amherst.
 Smith, Ethel M., Amherst.
 Smith, Mr. H. W., North Haven, Me.
 Southwell, Etta E., Brooklyn, N. Y.
 Spaulding, Rev. Arthur, Salem, N. Y.
 Spofford, Ellen W., Georgetown.
 Springer, Lydia J., Boston.
 Stanley, Dorothy, Amherst.
 Stevens, Clara E., Boston.
 Stevens, M. Dora, New Haven, Conn.
 Stone, Mrs. James S., South Framingham.
 Sullivan, Nellie L., Three Rivers.
 Swett, Ethel S., Beverly.

Swing, M. Ella, Bridgeton, N. J.
 Tapley, W. Thorpe, Revere.
 Tobin, Ellen C., Lawrence.
 Towne, Mary E., Amherst.
 Turner, Mable E., North Reading.
 Vauthier, Mr. L. P. F., Halifax.
 Walden, Margaret C., Deerfield.
 Watkins, Fred H., Gilbertsville.
 Waugh, Dorothy, Amherst.
 Webber, Mrs. Josephine R., Waltham.
 Webber, Winona, Newton.
 Wheeler, Mildred L., Taunton.
 Wheelock, Mr. H. M., Dorchester.
 White, Laura Bradstreet, Brighton.
 Whitney, Joseph T., Medford.
 Wight, Edith A., Waltham.
 Williams, Mabelle E., Amherst.
 Wilson, Warren H., New York.
 Winder, John H., Jr., Coppahosic, Va.
 Winn, Annah, Westfield, N. J.
 Wo, S. P., Amherst.
 Yang, Y. O., Amherst.

Total, 227.

SUMMARY OF SHORT COURSES.

Winter Course Students.

Massachusetts, ...	53	Maine, ...	1
Connecticut, ...	5	Washington, D. C., ...	1
New York, ...	3		—
Pennsylvania, ...	2		65

Summer School Students.

Massachusetts, ...	173	Washington, D. C., ...	2
New York, ...	20	Illinois, ...	1
Connecticut, ...	8	Maine, ...	1
New Jersey, ...	8	Maryland, ...	1
Rhode Island, ...	4	Vermont, ...	1
Pennsylvania, ...	4		—
New Hampshire, ...	2		227
Ohio, ...	2		

Poultry Course.

Massachusetts, ...	47
New York, ...	2
Connecticut, ...	1
New Jersey, ...	1
	—
	51

Beekeepers.

Massachusetts, ...	18
Virginia, ...	1
	—
	19

UNREGISTERED ATTENDANTS.

Rural Conference of Social Workers.

Massachusetts, ...	289	Colorado, ...	1
New York, ...	13	Ohio, ...	1
Connecticut, ...	11	Maryland, ...	1
New Jersey, ...	5	Rhode Island, ...	1
New Hampshire, ...	4	Maine, ...	2
Vermont, ...	4	Illinois, ...	2
Pennsylvania, ...	4		—
Washington, D. C., ...	3		341

Farmers' Week.

Massachusetts, ...	533	California, ...	1
Connecticut, ...	9	Montana, ...	1
Maine, ...	4	Michigan, ...	1
Rhode Island, §, ...	3	New Mexico, ...	1
New York, ...	3		—
New Hampshire, ...	2		559
Vermont, ...	1		

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Massachusetts, ...	360
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SECRETARIES OF ALUMNI ASSOCIATIONS AND CLASSES.

Alumni Secretaries' Association of the Massachusetts Agricultural College.

Secretary: RALPH J. WATTS, 1907, Amherst, Mass.

Associate Alumni of the Massachusetts Agricultural College.

Secretary: SIDNEY B. HASKELL, 1904, Amherst, Mass.

Local Alumni Association of the Massachusetts Agricultural College.

Secretary: SIDNEY B. HASKELL, 1904, Amherst, Mass.

Alumni Club of Massachusetts.

Secretary: HERBERT W. DANA (1899), Care of R. H. White Company, Boston, Mass.

Connecticut Valley Association of the Massachusetts Agricultural College.

Secretary: WALTER B. HATCH, 1905, Torrington, Conn.

Massachusetts Agricultural College Club of New York.

Secretary: JOHN ASHBURTON CUTTER, 1882, 262 West 77th Street, New York, N. Y.

Massachusetts Agricultural College Club of Washington, D. C.

Secretary: CLARENCE H. GRIFFIN, 1904, 3438 Mount Pleasant, Washington, D. C.

Western Alumni Association of the Massachusetts Agricultural College.

Secretary: CHARLES A. TIRRELL, 1906, 4012 Perry Street, Chicago, Ill.

Massachusetts Agricultural College Pacific Coast Alumni Association.

Secretary: THOMAS F. HUNT, 1905, Berkeley, Cal.

Class Secretaries.

Class of	SECRETARY.	Secretary's address.
1871	E. E. Thompson, . . .	Worcester, Mass.
1872	S. T. Maynard, . . .	Northborough, Mass.
1873	C. Wellington, . . .	Amherst, Mass.
1874	— — —	— — —
1875	M. Bunker, . . .	Newton, Mass.
1876	C. Fred Deuel, . . .	Amherst, Mass.
1877	— — —	— — —
1878	C. O. Lovell, . . .	48 Summer Street, Boston, Mass.
1879	R. S. Swan, . . .	Worcester, Mass.
1880	— — —	— — —
1881	J. L. Hills, . . .	Burlington, Vt.
1882	G. D. Howe, . . .	Bangor, Me.
1883	J. B. Lindsey, . . .	Amherst, Mass.
1884	L. Smith, . . .	25 Mercantile Street, Worcester, Mass.
1885	E. W. Allen, . . .	Washington, D. C.
1886	Dr. Winfield Ayres, . . .	616 Madison Avenue, New York, N. Y.
1887	F. H. Fowler, . . .	Shirley, Mass.
1888	H. C. Bliss, . . .	Attleborough, Mass.
1889	C. S. Crocker, . . .	25 South Van Pelt Street, Philadelphia, Pa.
1890	David Barry, . . .	Amherst, Mass.
1891	H. T. Shores, . . .	Northampton, Mass.
1892	H. M. Thomson, . . .	Amherst, Mass.
1893	F. A. Smith, . . .	Ipswich, Mass.
1894	S. F. Howard, . . .	Amherst, Mass.
1895	H. A. Ballou, . . .	Barbadoes, W. I.
1896	— — —	— — —
1897	C. A. Peters, . . .	Moscow, Idaho.
1898	— — —	— — —
1899	D. A. Beaman, . . .	Ponce, Porto Rico.
1900	E. K. Atkins, . . .	Northampton, Mass.
1901	J. H. Chickering, . . .	Dover, Mass.
1902	H. L. Knight, . . .	1731 T Street, Washington, D. C.
1903	G. D. Jones, . . .	North Amherst, Mass.
1904	P. F. Staples, . . .	North Grafton, Mass.
1905	P. F. Williams, . . .	Auburn, Ala.
1906	Richard Wellington, . . .	Geneva, N. Y.
1907	J. N. Summers, . . .	Amherst, Mass.
1908	Jas. A. Hyslop, . . .	205 D Street, Washington, D. C.
1909	Charles S. Putnam, . . .	Walpole, N. H.
1910	Henry T. Cowles, . . .	Central High School, Santurce, P. R.

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Massachusetts Agricultural College Bulletin

VOL. III. NO. 2. AMHERST, MASS., JULY 1911

NO. 600, 1911

Summer School of Agriculture

AND COUNTRY LIFE



JULY 5th to AUGUST 4th
1911

Professors and their classes will be in attendance at the Agricultural College
Amherst, Massachusetts, during the months of July, August, September, and October.

For a full and complete description of the courses at Agricultural College



" THE AMHERST MOVEMENT "

MASSACHUSETTS AGRICULTURAL COLLEGE

SUMMER SCHOOL OF AGRICULTURE

AND COUNTRY LIFE



1911

GENERAL ANNOUNCEMENT

AMHERST, MASS.

ANNOUNCEMENT

The Summer School of Agriculture and Country Life at Massachusetts Agricultural College will open July 5th, 1911, for a term of nearly five weeks, closing August 4th. This will be the fifth session of this Summer School, those of the past four years having been highly successful. The experience of these four years will aid in



“ CHAPEL ”

making material improvements for the session of 1911. The work of the Summer School was designed originally for school teachers, and the attendance has been largely of that class. Special attention will be given to the needs of teachers again this year. It has been found, however, that there are many persons who seek a general knowledge of theoretical and practical agriculture and who can come to the college conveniently during the summer season. Extended

courses will be offered for the benefit of such persons also. The courses offered for the current year may be somewhat roughly grouped as follows:

1. Courses in practical agriculture and horticulture.
2. Courses in elementary sciences bearing on agriculture and horticulture.
3. Courses in agricultural education.
4. Courses in agricultural economics and rural sociology.
5. Courses in domestic economy and household science.

From these courses it will be possible to make up programs of work suitable to the needs of almost everyone, but especially to school teachers, principals, superintendents, school committeemen, farm owners, householders, suburban residents, clergymen, pastors, preachers, social workers, and those who have only a general interest in agriculture. Persons who are in doubt as to what courses will best suit their needs would better correspond with the Director of the Summer School, who will gladly advise in all such matters.

CALENDAR FOR SUMMER SCHOOL

Wednesday, July 5th, General Registration.

Thursday, July 20th, Courses for second two weeks begin.

Monday, July 24th, Registration for Clergymen and Rural Social Workers' Courses.

Wednesday, August 2nd (noon), Regular classes finish.

Wednesday, August 2nd (noon) to Friday, August 4th (evening), inclusive, Annual Conference of Rural Social Workers.

THE SUMMER SCHOOL FACULTY

KENYON L. BUTTERFIELD, LL. D., President of the College and Professor of Rural Sociology.

WILLIAM D. HURD, M. Agr., Director of Extension Work.

ALEXANDER E. CANCE, Ph. D., Assistant Professor of Agricultural Economics.

ANNETTE F. CHASE, Instructor in Home Economics, Simmons College, Boston.

JOSEPH CHAMBERLAIN, Ph. D., Associate Professor of Chemistry.

ELMER K. EYERLY, A. M., Assistant Professor of Rural Sociology.

HENRY T. FERNALD, Ph. D., Professor of Entomology.

BURTON N. GATES, Ph. D., Assistant Professor of Beekeeping.

JOHN C. GRAHAM, Associate Professor of Poultry Husbandry.

CHARLES R. GREEN, B. Agr., Librarian.

WILLIAM R. HART, A. M., Professor of Agricultural Education.

SIDNEY B. HASKELL, B. Sc., Assistant Professor of Agronomy.

CHARLES S. HELLER, Instructor in Market Gardening.

GEORGE N. HOLCOMB, S. T. B., Lecturer in Political Science.

FLOYD B. JENKS, B. Sc. Agr., Assistant Professor of Agricultural Education.

WILLIAM P. B. LOCKWOOD, B. Sc. Agr., Associate Professor of Dairying.

JOHN A. MCLEAN, B. A., Associate Professor of Animal Husbandry.

C. J. MAYNARD, Author and Lecturer, Newton, Mass., Instructor in Bird Life.

FRANK F. MOON, M. F., Associate Professor of Forestry.

A. VINCENT OSMUN, M. Sc., Assistant Professor of Botany.

PERCY L. REYNOLDS, M. D., Assistant Professor of Physical Education and Hygiene.

EDWARD TALLMADGE ROOT, Secretary of the Federation of Churches, Massachusetts and Rhode Island.

FRED C. SEARS, M. Sc., Professor of Pomology.

FRANK A. WAUGH, M. Sc., Professor of Landscape Gardening.

EDWARD A. WHITE, B. Sc., Professor of Floriculture.

WARREN H. WILSON, Ph. D., Superintendent Department, Church and Country Life, Presbyterian Board of Home Missions, New York.

COMMITTEES OF THE SUMMER SCHOOL FACULTY

COURSES OF STUDY AND REGISTRATION

Professors Haskell, Graham, Cance, Hurd.

EXCURSIONS

Professors Jenks, White, Osmun, Hurd.

SOCIAL EVENINGS

Professors Sears, Hart, McLean, Hurd.

ATHLETICS AND RECREATION

Professors Lockwood, Waugh, Eyerly, Reynolds, Hurd.

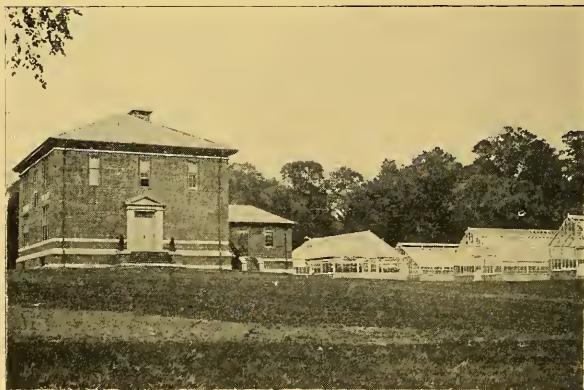
So far as possible, the members of the Summer School faculty are selected from the regular faculty of the College. Where instructors are engaged from other institutions great care is taken to secure men and women eminent in their respective lines of work.

THE COURSES OF STUDY

Group A. General Agriculture, Dairying and Animal Husbandry

1. SOILS AND TILLAGE. The chemical, physical and biological composition of the soil and the relation of each to plant growth;

the formation of soils; natural and artificial sources of fertility; the methods and implements of tillage; the whole forming an introduction to modern scientific agriculture. Five exercises weekly the first



“NEW PLANT HOUSE”

two weeks. Should be followed by Course 2. PROF. HASKELL.

2. **FIELD CROPS.** Class room, laboratory and field exercises designed to show modern methods of managing the principal field crops of New England, such as the grasses, the clovers, corn, potatoes, etc. Five exercises each week for second two weeks. Should be preceded by Course 1 **PROF. HASKELL.** Courses 1 and 2 together meet in excellent fashion the needs of those who want general elementary instruction in practical agriculture.



" HAYING "

3. **DOMESTIC ANIMALS.** This very instructive course will deal with the different breeds of farm animals; how to study and judge them, modern methods of care, sanitation, breeding and feeding. Living domestic animals supply the best of all objects for teaching purposes in primary and intermediate schools, and this course should prove very suggestive to capable teachers. Five hours a week, four weeks. **PROFESSOR McLEAN.**



4. **MODERN DAIRYING.** A strictly up-to-date course in the production and handling of milk and cream, probably the most important branch of agricultural industry in Massachusetts. The



"BARN"

course will be practical rather than theoretical, and will cover briefly, composition and secretion of milk; principles and

methods of creaming; abnormal milk and causes; proper handling of milk and cream on the farm; value of milk as food; relation of milk to the public health; handling and care of milk in the home; methods used in production of sanitary and certified milk. Five exercises weekly for four weeks. **PROFESSOR LOCKWOOD.**

5. **POULTRY BREEDING AND MANAGEMENT.** The Summer course in poultry will cover the following subjects: Poultry House Construction; Incubation and Brooding; Care of Poultry in Summer; Winter Egg Production; Marketing Eggs and Poultry; and Poultry



"JUDGING AND SCORING BIRDS"

Diseases. The laboratory work will consist of caring for incubators and brooders and managing young chicks. The poultry plant will be in process of construction and practical work will be given along this line. Three lectures and two laboratory periods per week. Beginning July 5th. **PROFESSOR GRAHAM.**

Group B. Horticulture, Forestry, Landscape Gardening

6. **FRUIT GROWING.** Modern methods of planting, cultivating, pruning, fertilizing and spraying fruit trees, of planning and managing orchards, and of selling fruit. Lectures, demonstrations and ample field exercises. Five exercises weekly for four weeks. PROFESSOR SEARS.

7. **PRACTICAL GARDENING.** This course will consist almost wholly of practical field exercises in planting, training, cultivating, etc., and while no special effort will be made to put the work into common school form, the exercises will be especially valuable to school garden teachers. Course limited to twenty pupils. Five exercises weekly, two hours each, first four weeks. MR. HELLER.

8. **TREES AND SHRUBS.** A practical course in arboriculture, covering native and exotic trees and shrubs, their identification, propagation and culture. Five exercises weekly, first two weeks of the term. PROFESSOR WHITE. This course is especially suited to precede Course 10 and to go with Course 9.



"SPRAYING CLASS"

9. **FORESTRY.** This course of ten lectures will cover the growth of the forestry movement in this country; the status of forestry in the United States and abroad, and the possibilities of better forestry in Massachusetts. The problems of woodland management will be briefly discussed and specific problems will be considered at private conference hours by appointment. Ten lectures, beginning July 5th. PROFESSOR MOON.



"EXCURSION PARTY"

10. **LANDSCAPE GARDENING.** Some of the elementary principles of the art in their immediate application to the improvement of school grounds, the treatment of home grounds and to village and rural improvement; also the use of landscape study as a branch of art for teaching in the public schools. Ten lectures and field exercises weekly, beginning July 20th. **PROFESSOR WAUGH.**

SUMMER SCHOOL COURSES IN CHEMISTRY

Group C. Sciences Related to Agriculture

11. **ELEMENTARY CHEMISTRY.** An introduction to Chemistry with special reference to agriculture and agricultural industries.



The course consists largely of laboratory experiments and is adapted especially to science teachers or to those who simply wish to know something of this fundamental science. Five exercises (two-hour pe-

“ROOM IN LABORATORY”

riods) per week for four weeks. **PROFESSOR CHAMBERLAIN** and **PROFESSOR HOWARD.**

12. **AGRICULTURAL CHEMISTRY.** This course considers briefly some of the more common and important facts in the chemistry of soils, fertilizers, plants and animals, studying their composition, reactions and relations to each other and showing the reasons for agricultural practices. It is aimed to make the course practical and suggestive, especially to those engaged in Agricultural High School work, and it is therefore largely experimental. As some previous knowledge of Chemistry is assumed, Course 11 or its equivalent is required. Five exercises (two-hour periods) per week for four weeks. **PROFESSOR CHAMBERLAIN** and **PROFESSOR HOWARD.**

13. **PLANT EXPERIMENTS.** A lecture course illustrated by simple experiments in plant life with home-made apparatus. A valuable course for science teachers and others interested in plant life.

Five exercises weekly for two weeks, beginning July 5th. DR. STONE.

14. PLANT LIFE. Types of plants, their morphology, structure and classification, with special reference to the fungi and ferns. This course is especially suited to the needs of science and nature study teachers, and amateur botanists. Five lectures weekly for two weeks, beginning July 20th. PROFESSOR OSMUN.

15. CRYPTOGAMIC BOTANY. A laboratory course consisting of microscopic and field study of cryptogamic plants. For those who have taken Courses 13 and 14 at former sessions or who have had previous training in botany. Limited to twenty pupils. Two three-hour exercises weekly for two weeks, beginning July 20th. PROFESSOR OSMUN.

16. BIRD LIFE. A study of the local bird fauna, conducted largely in the field. Special attention is given to economic relations of the birds and to nesting habits. Five exercises weekly, beginning July 5th. MR. MAYNARD.

17. INSECT LIFE. An introductory course arranged with especial reference to the needs of teachers in the grade schools and high schools, and also those expecting to take up lines of agricultural work where some knowledge of insects is desirable. The forms selected for study are those easily obtained and of economic importance. How to recognize these and their work, and how to control them will be given especial attention, and methods of making collections will also be included. A portion of the time will be spent in the field, studying insects under natural conditions. Three class and two laboratory or field periods for four weeks. PROFESSOR FERNALD.

18. ENTOMOLOGY. A course planned to follow the preceding, and for persons who already have some knowledge of the subject. Careful studies on insect life histories, habits, their relation to disease, and on forms not included in the introductory course. Three lectures and two laboratory or field periods for four weeks. PROFESSOR FERNALD.



‘DRAPER HALL’

19. BEEKEEPING. (It is not certain that this course will be given.) If given it will comprise the practical phases of the Beekeeping Industry, Beekeepers' Equipment, Handling of Bees and of Honey, the Diseases of the Honey Bee, etc. The place the study of

SCHEDULE

Day	8:15	9:15	10:15	11:15	Afternoon
Monday	1. Soils and Tillage (1st, 2 weeks) 2. Field Crops (2d, 2 weeks) 3. Poultry Class (4 weeks) 4. Trees and Shrubs (1st, 2 weeks) 5. Elementary Chemistry (1st, 2 weeks) 6. Insect Life (4 weeks) 7. Rural Domestic Science (1st, 2 weeks) 8. Household Science (1st, 2 weeks) 9. High School Agric. Lab. (July 25th) 10. Agricultural Economics (July 25th)	4. Dairying (4 weeks) 5. Fruit Growing (4 weeks) 6. Forestry (1st, 2 weeks) 7. Landscape Gardening (1st, 2 weeks) 8. Elementary Chemistry (1st, 2 weeks) 9. Plant Life (2d, 2 weeks) 10. High School Agric. Lab. (July 25th) 11. New England Agric. (July 25th) 12. School Problems (July 25th)	1. Domestic Animals (4 weeks) 2. Practical Gardening (4 weeks) 3. Agricultural Chemistry (4 weeks) 4. Plant Experiments (4 weeks) 5. Cytogeamic Botany (4 weeks) 6. Home Economics (4 weeks) 7. School Gardens (4 weeks) 8. Church and Rural Prob. (July 25th) 9. Cooperation (July 25th)	7. Practical Gardening (4 weeks) 8. Agricultural Chemistry (4 weeks) 9. Cytogeamic Botany (4 weeks) 10. Beekeeping (2d, 2 weeks) 11. Develop. Rural Comm. (July 25th) 12. Rural Literature (July 25th)	Informal conferences or educational trips, arranged by the different instructors.
Tuesday	1. Soils and Tillage 2. Field Crops 3. Poultry Class 4. Trees and Shrubs 5. Elementary Chemistry 6. Insect Life 7. Rural Domestic Science 8. Household Science 9. High School Agric. 10. Agricultural Econ.	4. Dairying 5. Fruit Growing 6. Forestry 7. Landscape Gardening 8. Elementary Chemistry 9. Plant Life 10. High School Agric. Lab. 11. New England Agric. 12. School Problems	1. Domestic Animals 2. Practical Gardening 3. Agricultural Chem. 4. Plant Experiments 5. Cytogeamic Bot. 6. Home Economics 7. School Gardens 8. Church and Rural Prob. 9. Cooperation	7. Practical Gardening 8. Agricultural Chem. 9. Bird Life 10. Beekeeping 11. Develop. of Rural Comm. 12. Rural Literature	Informal conferences or educational trips, arranged by the different instructors. Social evening.
Wednesday	1. Soils and Tillage 2. Field Crops 3. Poultry Class 4. Trees and Shrubs 5. Elementary Chemistry 6. Insect Life 7. Rural Dom. Sci. 8. Household Science Lab. 9. High School Agric. 10. Agric. Econ.	4. Dairying 5. Fruit Growing 6. Forestry 7. Landscape Gardening 8. Elementary Chemistry 9. Plant Life 10. High School Agric. 11. New England Agric. 12. School Problems	1. Domestic Animals 2. Practical Gardening 3. Agric. Chem. 4. Cytogeamic Botany 5. Home Economics 6. School Gardens 7. Church and Rural Prob. 8. Cooperation	7. Practical Gardening 8. Agric. Chem. 9. Cytogeamic Botany 10. Beekeeping 11. Develop. of Rural Comm. 12. Rural Literature	Informal conferences or educational trips, arranged by the different instructors. Regular midweek excursion.
Thursday	1. Soils and Tillage 2. Field Crops 3. Poultry Class 4. Trees and Shrubs 5. Elementary Chemistry 6. Insect Life 7. Rural Dom. Sci. Lab. 8. Household Sci. Lab. 9. High School Agric. 10. Agric. Econ.	4. Dairying 5. Fruit Growing 6. Forestry 7. Landscape Gardening 8. Elementary Chemistry 9. Plant Life 10. High School Agric. Lab. 11. New England Agric. Lab. 12. School Problems	1. Domestic Animals 2. Practical Gardening 3. Agric. Chem. 4. Cytogeamic Bot. 5. Home Economics Lab. 6. School Gardens 7. Church and Rural Prob. 8. Cooperation	7. Practical Gardening 8. Agric. Chem. 9. Bird Life 10. Entomology Lab. 11. Home Econ. Lab. 12. Develop. of Rural Comm. 13. Rural Literature	Informal conferences or educational trips, arranged by the different instructors.
Friday	1. Soils and Tillage 2. Field Crops 3. Poultry Class 4. Trees and Shrubs 5. Elementary Chemistry 6. Insect Life 7. Rural Dom. Sci. 8. Household Sci. Lab. 9. High School Agric. 10. Agric. Econ.	4. Dairying 5. Fruit Growing 6. Forestry 7. Landscape Gardening 8. Elementary Chemistry 9. Plant Life 10. High School Agric. 11. School Problems	1. Domestic Animals 2. Practical Gardening 3. Plant Experiments 4. Cytogeamic Botany 5. Home Economics 6. School Gardens 7. Church and Rural Prob. 8. Cooperation	7. Practical Gardening 8. Agric. Chem. 9. Cytogeamic Botany 10. Beekeeping 11. School Gardens 12. Rural Literature	Informal conferences or educational trips, arranged by the different instructors.
Saturday	All Day Excursion to Point of Interest.				
Sunday	Vespers at Five O'clock P. M.				

the honey bee may take in nature study work will be fully treated. Five times a week for two weeks, beginning July 20th. PROFESSOR GATES.

Group D. Home Economics

20. DOMESTIC SCIENCE FOR RURAL AND VILLAGE SCHOOLS. A course of the most elementary nature, treating of the equipment and work that might be carried out in rural or village schools,—the equipment, its cost; simple lessons in cookery showing what might be prepared as school luncheons, etc.; food values; household science, sanitation, etc. Three lectures and two cooking demonstrations weekly for two weeks, beginning July 5th. MISS CHASE.

21. HOME ECONOMICS. A more general course in which an attempt is made to acquaint those taking the course with the field of Home Economics, food, clothing, sanitation, home decoration, household management, etc. Three lectures and two demonstrations weekly for four weeks. MISS CHASE.

22. HOUSEHOLD SCIENCE. This course is given especially for the benefit of the wives of the clergymen who take work in the Summer School. Questions of food values, home accounting, menus, labor-saving devices, etc., will be taken up. Eight lectures and demonstrations, beginning July 25th. MISS CHASE.

Group E. Agricultural Education

23. HIGH SCHOOL AGRICULTURE. High School Agriculture, covering the organization of high schools for the teaching of agriculture, equipment, courses of study, relation of school and home activities, etc. Two lectures or recitation periods of one hour each and three laboratory or field periods of two hours each per week. The laboratory and field work will consist of exercises or practicums suitable for high school work. Four weeks, beginning July 5th. PROFESSOR JENKS.

24. SCHOOL AND HOME GARDENS. A course consisting of eight lectures and twelve practical garden exercises, accompanied by assigned readings in the library. The lectures will cover such points as the planning, laying out and assigning plots for school gardens, the supervision and direction of both school and home gardens, the use of window boxes for the study of soil and the germination of seeds, the study of weeds and wild flowers and plants, the study of tools and seeds, the improvement of school grounds, back yards, and unkempt lots. The garden exercises will include the preparation of the soil, the planting of seeds, transplanting, transferring plants from field to pots, tillage, fertilizing. In addition to giving attention to a variety of plants, each member of the class will make an intensive study of some single vegetable. Four weeks. PROFESSOR HART.

Group F. Courses Especially for Clergymen and Other Rural Workers

25. NEW ENGLAND AGRICULTURE. An outline of the agricultural situation in New England, considering general conditions, the status of agricultural practice and the farmers' business problems.

The course is strongly recommended to clergymen, rural social workers and those interested in the broader aspects of New England agriculture. Eight lectures, beginning July 25th. PROFESSOR HURD.

26. AGRICULTURAL ECONOMICS. A series of ten lectures on agriculture considered as an industry and on some of the immediate social and economic problems of the farmer. Some of the topics treated are: The characteristics of the agricultural industry; the relation of agriculture to other industries; the maintenance of the economic position of the farmer; the farmer and the market; co-operative endeavors; organization of the rural social forces. The lectures will deal in a very general and simple way with the problems of farm life, and are designed to give a helpful viewpoint to teachers and leaders in rural communities. Eight lectures, beginning July 25th. DR. CANCE.

27. THE CHURCH AND THE RURAL PROBLEM. (a) The Church in relation to the spiritual life of the rural community. Four lectures, beginning July 25th. REV. E. T. ROOT.

(b) The Church in its relation to the industrial development of the rural community. Four lectures, beginning July 29th. REV. WARREN H. WILSON.

28. THE DEVELOPMENT OF THE RURAL COMMUNITY. Eight lectures, discussing briefly the question of community building in rural neighborhoods, community ideals, forces to be utilized, and general programs for betterment. Eight lectures, beginning July 25th. PRESIDENT BUTTERFIELD.

29. THE SOCIOLOGICAL ASPECTS OF COOPERATION AMONG FARMERS. Social causes of early unsuccessful attempts at cooperation among farmers in the United States; social conditions and personal qualities necessary to successful cooperation, as these are exemplified especially in European countries; the various forms of cooperative organization viewed in their intellectual and moral aspects; the influence of cooperation on individualism, conservatism, self-help and social strain, on scientific agriculture, on farm labor, on legislation; the relation of cooperation to neighborhood life, to community pride and loyalty, to further associated effort, to class stability, solidarity and status; the demand of cooperation for a new type of leadership. Eight lectures, beginning July 25th. PROFESSOR EYERLY.

30. RURAL LITERATURE. A study of the literature, both prose and poetry, which interprets nature from the viewpoint of the lover of country life, and presents the idealistic side of agriculture and other rural pursuits. Eight lectures, beginning July 25th. DR. HOLCOMB.

31. RURAL SCHOOL PROBLEMS. A course of eight lectures, accompanied by library readings. The course will include a discussion of vocational aims in education, the value of agricultural science as subject matter, the redirection of the rural school for community ends and aims, the organization of rural school curricula, the rural school teachers' problems, and the ideal rural school. PROFESSOR HART.

CONFERENCE OF RURAL SOCIAL WORKERS

AUG. 2nd, 3d, 4th INCLUSIVE

Last year the College held a four days' Conference for Rural Social Workers, as a closing feature of the Summer School. This



“ CONFERENCE ”

Conferences are to be arranged for country clergymen, rural librarians, county Y. M. C. A. workers, grange officers, town officers, school superintendents and officers, home makers, village improvement societies and others interested in the development of country life.

Each section holds an informal conference, two hours in length, each forenoon. Each afternoon all come together for a general session at which brief reports are heard from the morning sections. The afternoon meetings are addressed by leaders of thought in line with the general subject for the day.

The College engages a speaker of international reputation for the evening meetings.

This year a camp of men studying problems of leadership in the rural community under the auspices of the County Work department of the Y. M. C. A. will be held from July 29th to August 5th.

Arrangements are being made to have a Rural Social service exhibit at the College during the conference. It is hoped that the following lines of work will be graphically shown: The county rural work of the Y. M. C. A.; Country church work; Village improvement; Civic work in rural communities; Rural recreation; Grange work; Agricultural press; Good roads; High School agriculture; Rural sanitation; Rural social settlement work; Home economics; Rural libraries; Rural art; The Massachusetts Board of Agriculture; The Massachusetts Experiment Station; and the Extension work of the College.

A complete program of this conference, it is hoped, will be ready for distribution in June.

GENERAL PLAN OF THE SUMMER SCHOOL WORK

The formal instruction in the Summer School is given in thirty-one definite courses herein described. From these each pupil may elect courses of not less than ten nor more than fifteen exercises a week, unless a larger or smaller amount of work be allowed by the Di-

rector. These courses include a large amount of field work, observation trips, outdoor exercises and laboratory experiments.

Besides these, general field exercises will be arranged for one afternoon of each week. These will be on topics of interest to all. Class excursions will be arranged for every Wednesday afternoon, and more extended excursions for the whole school will be planned for every Saturday. These excursions will be in charge of an instructor as heretofore. In the past they have proved a very enjoyable feature of the work.

Round table and special discussions will be arranged by various instructors as their courses require. A conference of rural social workers and educators of New England will be held August 2nd, 3rd and 4th. An outline of the conference will be found in another part of this bulletin.

A course of evening lectures on popular topics relating to the work of the school will be a feature of the general program. Several able lecturers have already been engaged for this course. Like everything else connected with the Summer School, this lecture course is entirely free to all students.

ELECTION OF COURSES

Election of courses should be made at the time of registration. Every election is subject to the approval of the Director and of the instructor whose course is elected. As it will be necessary to schedule several courses at the same time, certain combinations of courses will be made unavailable. It should be specially noticed that certain courses are offered to a limited number of pupils only, and as a rule pupils will be accepted in these courses in the order of application. Each pupil should choose such combinations of courses as will keep two or three subjects in hand at the same time. This will meet the requirement that each one must take at least ten and not more than fifteen exercises a week, unless permitted to take more or less by special order of the Director.

REGISTRATION, ATTENDANCE, ETC.

Those who expect to attend should register as early as possible. *Registration fee for the Summer School is \$5, payable at the time application is made. Registration fee for the clergymen attending the courses and conferences given especially for them is \$1.* No other tuition is charged. These fees should accompany application blanks and should be made payable to the Director of the Summer School, or the College Treasurer. A schedule and registration blank are to be found in the back part of this bulletin. Registration fees will be refunded to those who find it impossible to attend the school.

Attendance will be required in the courses elected. Some sort of examination, test or permanent note book will be required in each

course. Those who complete courses in a satisfactory manner, including practically perfect attendance, will be given certificates at the close of the term showing what work has thus been completed.

There are no rules or regulations whatever. Persons are not admitted to the Summer School who are not old enough to know how to behave, and everyone is expected to know and conform to the usages of good society. This absence of rules has worked admirably in the past, and it gives everyone a sense of freedom based on personal responsibility, the basis of all proper government, whether in school, college or the community.

TUITION IS ABSOLUTELY FREE, and there are no incidental charges. The College is supported by the State and the Federal governments, and receives no payments whatever from Summer School pupils except for room, board, and the registration fee, as mentioned above.

ROOMS AND BOARD

Rooms will be provided in the College dormitories and in private houses adjoining the College grounds. In general, the dormitory rooms are in suites of two bedrooms, opening into one study room, the bedrooms furnished with single beds. These rooms are nearly all located in two dormitories known as North College and South



"SOUTH DORMITORY"

College. The toilet and bathrooms are in the basements and water is not provided in the rooms. While the appointments in general are not those of a high-priced summer hotel, they are sanitary and comfortable, and have been found pleasant by men students for many years and by the women students of the Summer School during two summers. A uniform rate of \$1 a week for each person will be charged for these rooms, and each pupil will be expected to supply her own blankets, sheets, pillow cases, towels and napkins. Convenient arrangements for laundry work may be made in Amherst.

The dormitories are reserved for women students exclusively.

ALL REQUESTS FOR DORMITORY ROOMS MUST BE MADE TO, AND ROOMS WILL BE ASSIGNED BY THE COLLEGE TREASURER. A DEPOSIT OF \$2.00 IS REQUIRED IN ORDER TO HAVE A ROOM IN A DORMITORY RESERVED. THIS DEPOSIT IS NOT REFUNDED TO THOSE WHO FIND IT IMPOSSIBLE TO ATTEND.

The College will also supply a small number of first-class United States army wall tents for those who wish them. Each tent will

accommodate two persons. The tents will be placed in a pleasant and convenient location on the College campus, and every reasonable provision will be made for the comfort of the occupants. This form of domicile has been found very acceptable in other summer schools, chautauquas and camps. Those who care for real outdoor life at its best will find these arrangements genuinely enjoyable. The charge for these tents will be \$1 a week for each person.

Rooms outside the College vary considerably in their accommodations and somewhat in price, the charge ranging from \$1 to \$2 a week for each person. A FEW DAYS PRIOR TO THE OPENING OF THE SUMMER SCHOOL THE COLLEGE WILL MAKE A CANVASS OF THE VILLAGE IN ORDER TO OBTAIN A LIST OF AVAILABLE ROOMS. THIS WILL BE FURNISHED SUMMER SCHOOL STUDENTS AT THE TIME OF REGISTRATION. EVERY EFFORT WILL BE MADE BY THOSE IN CHARGE TO SEE THAT EVERYONE HAS COMFORTABLE ACCOMMODATIONS.

As far as possible, everyone who registers for the Summer School will be allowed to select his or her own room, either in the College dormitories or outside, and such selections will be offered strictly in the order of registration. The Summer School management, however, reserves the right to make such shifts and readjustments as may be necessary for the greater convenience and comfort of all.

Excellent meals are served in Draper Hall on the College grounds. The price to Summer School students for the summer of 1911 will be \$4 a week, payable in advance to the College Treasurer. Good boarding places can be secured outside the College if desired. No rebates are allowed on board and room where these are had for a fraction of a week.

LOCATION AND SURROUNDINGS

Amherst is one of the most delightful towns in New England, especially in summer. It is situated in the Connecticut valley, amidst fertile farms, and surrounded by wooded hills. It is reached by the Boston and Maine railroad, Southern division (97 miles west of Boston), or by the Central Vermont railroad. It may be reached also by trolley from Springfield, Holyoke, Northampton or Greenfield.

The surroundings of this Summer School, its organization and methods of work, are such as to make a stay of two to four weeks enjoyable in every way. It furnishes the pleasantest sort of outdoor life, with just enough of work and recreation, under the simplest possible organization. From the first, special attention has been given to the outdoor exercises and recreation features of the program, and these will be still further emphasized in 1911. The whole atmosphere of the place is such that a vacation spent at the Summer School, with moderate work, is more interesting and refreshing than the same time spent at a seaside or mountain resort.

ATHLETICS AND RECREATION

Athletics and sports of various kinds occupy a prominent place in the Summer School. Tennis tournaments for both men and women and baseball teams are organized. Walking and mountain climbing are also freely indulged in by Summer School students. Athletic contests with teams from surrounding towns are arranged, subject to the approval of the proper committee.

COLLEGE EQUIPMENT

The Massachusetts Agricultural College is endowed by the Federal government and by the State of Massachusetts for teaching and investigation in agriculture in the broadest sense. The College has a farm of over 400 acres in a high state of cultivation, and illustrates all the leading agricultural industries of Massachusetts and some of the best agricultural specialties. There is a large new range of greenhouses of the most modern and approved types just completed within the past year; there is a modern dairy barn with dairy cattle; there are good horses, pure bred swine, sheep and poultry; there are fields of corn, potatoes, clover and grass in season; orchards of apple, peach, plum and pear trees; tracts of good forest land, nurseries, market gardens, greenhouses, etc. A good school garden, maintained by cooperation between the College and the Amherst schools, will be in operation. There are also considerable tracts devoted to experiments, many of which are of unusual interest. Then there are well-equipped departments of botany, entomology and chemistry, dealing in the most thorough manner with these special sciences. All of this equipment (much more than can be described or even named) will be placed at the service of the Summer School.

CHAPEL AND VESPERS

Chapel exercises, fifteen minutes in length, are held each morning in the College chapel. At this time announcements for the day are given.

Vespers are held each Sunday afternoon at 5 o'clock, usually out of doors. Well-known preachers and other religious workers are engaged for these services, and special music is provided.

MASSACHUSETTS AGRICULTURAL COLLEGE
SUMMER SCHOOL OF AGRICULTURE

APPLICATION FOR REGISTRATION

Name (Mr., Mrs., or Miss)
Post office..... Street address.....
State..... Present occupation.....
Schools previously attended.....
.....
Present position.....

Consult the schedule and place an X after each course you wish to take. Send this blank to the Director.

Course	Course
1. Soils and Tillage.....	17. Insect Life.....
2. Field Crops	18. Entomology
3. Domestic Animals	19. Beekeeping
4. Modern Dairying.....	20. Rural School Domestic Science
5. Poultry Management.....	21. Home Economics.....
6. Fruit Growing.....	22. Household Science.....
7. Practical Gardening.....	23. High School Agriculture...
8. Trees and Shrubs.....	24. Home and School Gardens...
9. Forestry	25. New England Agriculture...
10. Landscape Gardening.....	26. Agricultural Economics...
11. Elementary Chemistry.....	27. Church and Rural Problem...
12. Agricultural Chemistry.....	28. Development of Rural Community
13. Plant Experiments.....	29. Cooperation in Agriculture...
14. Plant Life.....	30. Rural Literature.....
15. Cryptogamic Botany.....	31. Rural School Problems....
16. Bird Life.....	

I wish to take.....weeks' work, beginning.....
Preference regarding rooms (Read bulletin carefully).....
.....
.....
.....

Deposit registration fee.....
Deposit for room in dormitory.....
Accepted.....
Director.

CUT ALONG THIS LINE

EVENING LECTURES AND SOCIAL LIFE

The management of the Summer School provides at least one evening lecture each week. These lectures are usually given by men of international reputation, and deal with practical, social and economic subjects related to rural life.

One or two social evenings are arranged for each week. This,



"SOCIAL UNION"

together with the evening lectures, the regularly scheduled Wednesday and Saturday excursions, the afternoon field trips for study, make life at the Summer School extremely enjoyable as well as profitable.

These social evenings are under the direction of a committee of the faculty, working with the Summer School students.

CORRESPONDENCE

School committees, superintendents, teachers, clergymen, students of agriculture, and all others interested are invited to write for further particulars. Address all correspondence to

WILLIAM D. HURD,

Director of the Summer School,

Massachusetts Agricultural College,

Amherst, Mass.

Massachusetts Agricultural College Bulletin

Vol. III. No. 4. AMHERST, MASSACHUSETTS.

May, 1911

SUMMER SCHOOL OF AGRICULTURE AND COUNTRY LIFE

Courses for Country Clergymen



" CHAPEL "

JULY 24th to AUGUST 4th 1911

Published six times a year by the Massachusetts Agricultural College:
January, February, March, May, September, October.

Entered as second-class matter at the postoffice at Amherst, Mass.

"THE AMHERST MOVEMENT"

Announcement

This bulletin is a supplement to the complete bulletin describing the work given in the Summer School of Agriculture and Country Life at the Massachusetts Agricultural College. The courses described herein are arranged especially to meet the desire of country clergymen to make themselves more familiar with the practical, social, and economic phases of the new "country life movement."

During the Summer Schools of the past four years, many clergymen have found that besides getting much help and new inspiration, two or three weeks spent in Amherst associating with their fellows was exceedingly pleasant and profitable.

Attention is called to the other courses of the Summer School, which may also be taken by clergymen, the Conference of Rural Social Workers, and the information concerning rooms, board, etc., given elsewhere in this bulletin.

The Summer School proper opens July 5. A complete bulletin describing the courses can be secured by writing the Director.

The Summer School Faculty

KENYON L. BUTTERFIELD, LL. D., President of the College and Professor of Rural Sociology.

WILLIAM D. HURD, M. Agr., Director of Extension Work.

ALEXANDER E. CANCE, Ph. D., Assistant Professor of Agricultural Economics.

ANNETTE F. CHASE, Instructor in Home Economics, Simmons College, Boston.

JOSEPH CHAMBERLAIN, Ph. D., Associate Professor of Chemistry.

ELMER K. EYERLY, A. M., Assistant Professor of Rural Sociology.

HENRY T. FERNALD, Ph. D., Professor of Entomology.

BURTON N. GATES, Ph. D., Assistant Professor of Beekeeping.

JOHN C. GRAHAM, Associate Professor of Poultry Husbandry.

CHARLES R. GREEN, B. Agr., Librarian.

WILLIAM R. HART, A. M., Professor of Agricultural Education.

SIDNEY B. HASKELL, B. Sc., Assistant Professor of Agronomy.

CHARLES S. HELLER, Instructor in Market Gardening.

GEORGE N. HOLCOMB, S. T. B., Lecturer in Political Science.

FLOYD B. JENKS, B. Sc. Agr., Assistant Professor of Agricultural Education.

WILLIAM P. B. LOCKWOOD, B. Sc. Agr., Associate Professor of Dairying.

JOHN A. MCLEAN, B. A., Associate Professor of Animal Husbandry.

C. J. MAYNARD, Author and Lecturer, Newton, Mass., Instructor in Bird Life.

FRANK F. MOON, M. F., Associate Professor of Forestry.

A. VINCENT OSMUN, M. Sc., Assistant Professor of Botany.

PERCY L. REYNOLDS, M. D., Assistant Professor of Physical Education and Hygiene.

EDWARD TALLMADGE ROOT, Secretary of the Federation of Churches, Massachusetts and Rhode Island.

FRED C. SEARS, M. Sc., Professor of Pomology.

FRANK A. WAUGH, M. Sc., Professor of Landscape Gardening.

EDWARD A. WHITE, B. Sc., Professor of Floriculture.

WARREN H. WILSON, Ph. D., Superintendent Department, Church and Country Life, Presbyterian Board of Home Missions, New York.

Other Courses That May Be Taken

During the time the clergymen are at the College, the following courses are also in progress and may be taken by clergymen and their wives:

Field Crops	Landscape Gardening
Domestic Animals	Chemistry
Modern Dairying	Plant Life
Poultry Breeding and Management	Entomology
Fruit Growing	School Gardens
Practical Gardening	Home Economics

General Plan of the Summer School Work

The formal instruction in the Summer School is given in thirty-one definite courses. From these each pupil may elect courses of not less than ten nor more than fifteen exercises a week, unless a larger or smaller amount of work be allowed by the Director. These courses include a large amount of field work, observation trips, outdoor exercises and laboratory experiments.

Besides these, general field exercises will be arranged for one afternoon of each week. These will be on topics of interest to all. Class excursions will be arranged for every Wednesday afternoon, and more extended excursions for the whole school will be planned for every Saturday. These excursions will be in charge of an instructor as heretofore. In the past they have proved a very enjoyable feature of the work.

During the Summer School for clergymen, the Federation of Churches arranges for an extensive program of afternoon conferences and evening lectures. These are devoted to discussions of the spiritual, social, and administrative problems with which the clergyman must deal. The discussions are led and the lectures are given by some of the most prominent men in the seminaries, and in the social and educational work of this country.

A course of evening lectures on popular topics relating to the work of the school will be a feature of the general program. Several able lecturers have already been engaged for this course. Like everything else connected with the Summer School, these lectures are entirely free to all students.

Expenses, Living Accommodations, Etc.

The registration fee for clergymen is \$1.00. There is no tuition. Board is furnished at Draper Hall at \$4.00 a week. Rooms are available in the village at prices ranging from \$1.50 to \$3.00 per week.

In past years it has been possible to secure fraternity houses, or other large houses in the village so that a number of clergymen could live at one place, thus giving those who attend, a chance for close association. An effort will be made to make such arrangements again this year.

A limited number of furnished houses can be obtained for those who wish to bring their families, and will lease the houses for a month or more.

Those attending the course should provide their own bedding.

It will be seen that the necessary local expenses of attending the course need not be more than \$12.00.

All who expect to come are earnestly requested to make arrangements with the Director in advance.

"THE AMHERST MOVEMENT"

munity pride and loyalty, to further associated effort, to class stability, solidarity and status; the demand of cooperation for a new type of leadership. Eight lectures, beginning July 25th. PROFESSOR EYERLY.

RURAL LITERATURE. A study of the literature, both prose and poetry, which interprets nature from the viewpoint of the lover of country life, and presents the idealistic side of agriculture and other rural pursuits. Eight lectures, beginning July 25th. PROFESSOR HOLCOMB.

RURAL SCHOOL PROBLEMS. A course of eight lectures, accompanied by library readings. The course will include a discussion of vocational aims in education, the value of agricultural science as subject matter, the redirection of the rural school for community ends and aims, the organization of rural school curricula, the rural school teachers' problems, and the ideal rural school. PROFESSOR HART.

HOUSEHOLD SCIENCE. This course is given especially for the benefit of the wives of the clergymen who take work in the Summer School. Questions of food values, home accounting, menus, labor-saving devices, etc., will be taken up. Eight lectures and demonstrations, beginning July 25th. MISS CHASE.

Conference of Rural Social Workers

Aug. 2nd, 3rd, 4th Inclusive

Last year the College held a four days' Conference for Rural Social Workers, as a closing feature of the Summer School. This was so successful in every way that another, with a much more elaborate program, is being arranged for 1911.

Conferences are to be arranged for country clergymen, rural librarians, county Y. M. C. A. workers, grange officers, town officers, school superintendents and officers, home makers, village improvement societies and others interested in the development of country life.

Each section holds an informal conference, two hours in length, each forenoon. Each afternoon all come together for a general session at which brief reports are heard from the morning sections. The afternoon meetings are addressed by leaders of thought in line with the general subject for the day.

The College engages a speaker of international reputation for the evening meetings.

This year a camp of men studying problems of leadership in the rural community under the auspices of the County Work department of the Y. M. C. A. will be held from July 29th to August 5th.

Arrangements are being made to have a Rural Social service exhibit at the College during the conference. It is hoped that the following lines of work will be graphically shown: The county rural work of the Y. M. C. A.; Country church work; Village improvement; Civic work in rural communities; Rural recreation; Grange work; Agricultural press; Good roads; High School agriculture; Rural sanitation; Rural social settlement work; Home economics; Rural libraries; Rural art; The Massachusetts Board of Agriculture; The Massachusetts Experiment Station; and the Extension work of the College.

A complete program of this conference, it is hoped, will be ready for distribution in June.

"THE AMHERST MOVEMENT"

Committees of the Summer School Faculty

COURSES OF STUDY AND REGISTRATION

Professors Haskell, Graham, Cance, Hurd.

EXCURSIONS

Professors Jenks, White, Osmun, Hurd.

SOCIAL EVENINGS

Professors Sears, Hart, McLean, Hurd.

ATHLETICS AND RECREATION

Professors Lockwood, Waugh, Eyerly, Reynolds, Hurd.

So far as possible, the members of the Summer School faculty are selected from the regular faculty of the College. Where instructors are engaged from other institutions great care is taken to secure men and women eminent in their respective lines of work.

Courses Especially for Clergymen and Other Rural Workers

NEW ENGLAND AGRICULTURE. An outline of the agricultural situation in New England, considering general conditions, the status of agricultural practice and the farmers' business problems. The course is strongly recommended to clergymen, rural social workers and those interested in the broader aspects of New England agriculture. Eight lectures, beginning July 25th. PROFESSOR HURD.

AGRICULTURAL ECONOMICS. Eight lectures on agriculture considered as an industry and on some of the immediate social and economic problems of the farmer. Some of the topics treated are: The characteristics of the agricultural industry; the relation of agriculture to other industries; the maintenance of the economic position of the farmer; the farmer and the market; co-operative endeavors; organization of the rural social forces. The lectures will deal in a very general and simple way with the problems of farm life, and are designed to give a helpful viewpoint to teachers and leaders in rural communities. Eight lectures, beginning July 25th. DR. CANCE.

THE CHURCH AND THE RURAL PROBLEM. (a) The Church in relation to the spiritual life of the rural community. Four lectures, beginning July 25th. REV. E. T. ROOT.

(b) The Church in its relation to the industrial development of the rural community. Four lectures, beginning July 29th. REV. WARREN H. WILSON.

THE DEVELOPMENT OF THE RURAL COMMUNITY. Eight lectures, discussing briefly the question of community building in rural neighborhoods, community ideals, forces to be utilized, and general programs for betterment. Eight lectures, beginning July 25th. PRESIDENT BUTTERFIELD.

THE SOCIOLOGICAL ASPECTS OF COOPERATION AMONG FARMERS. Social causes of early unsuccessful attempts at cooperation among farmers in the United States; social conditions and personal qualities necessary to successful cooperation, as these are exemplified in European countries especially; the various forms of cooperative organization viewed in their intellectual and moral aspects; the influence of cooperation on individualism, conservatism, self-help and social strain, on scientific agriculture, on farm labor, on legislation; the relation of cooperation to neighborhood life, to com-

"THE AMHERST MOVEMENT"

Chapel and Vespers

Chapel exercises, fifteen minutes in length, are held each morning in the College chapel. At this time announcements for the day are given.

Vespers are held each Sunday afternoon at 5 o'clock, usually out of doors. Well-known preachers and other religious workers are engaged for these services, and special music is provided.

College Equipment

The Massachusetts Agricultural College is endowed by the Federal government and by the State of Massachusetts for teaching and investigation in agriculture in the broadest sense. The College has a farm of over 400 acres in a high state of cultivation, and illustrates all the leading agricultural industries of Massachusetts and some of the best agricultural specialties. There is a large new range of greenhouses of the most modern and approved types just completed within the past year; there is a modern dairy barn with dairy cattle; there are good horses, pure bred swine, sheep and poultry; there are fields of corn, potatoes, clover and grass in season; orchards of apple, peach, plum and pear trees; tracts of good forest land, nurseries, market gardens, greenhouses, etc. A good school garden, maintained by cooperation between the College and the Amherst schools, will be in operation. There are also considerable tracts devoted to experiments, many of which are of unusual interest. Then there are well-equipped departments of botany, entomology and chemistry, dealing in the most thorough manner with these special sciences. All of this equipment (much more than can be described or even named) will be placed at the service of the Summer School.

Location and Surroundings

Amherst is one of the most delightful towns in New England, especially in summer. It is situated in the Connecticut valley, amidst fertile farms, and surrounded by wooded hills. It is reached by the Boston and Maine railroad, Southern division (97 miles west of Boston), or by the Central Vermont railroad. It may be reached also by trolley from Springfield, Holyoke, Northampton or Greenfield.

The surroundings of this Summer School, its organization and methods of work, are such as to make a stay of two to four weeks enjoyable in every way. It furnishes the pleasantest sort of outdoor life, with just enough of work and recreation, under the simplest possible organization. From the first, special attention has been given to the outdoor exercises and recreation features of the program, and these will be still further emphasized in 1911. The whole atmosphere of the place is such that a vacation spent at the Summer School, with moderate work, is more interesting and refreshing than the same time spent at a seaside or mountain resort.

Correspondence

School committees, superintendents, teachers, clergymen, students of agriculture, and all others interested are invited to write for further particulars. Address all correspondence to

WILLIAM D. HURD,
Director of the Summer School,
Massachusetts Agricultural College,
Amherst, Mass.

THE M. A. C. BULLETIN

Vol. III. No. 5.

Amherst, Mass.

September, 1911

SUPPLEMENT TO 1911 CATALOG

The Massachusetts Agricultural College

ANNOUNCEMENT OF COURSES FOR 1911-1912



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January, February, March, May, September, October

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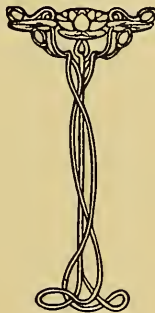
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Massachusetts Agricultural College Faculty 1911

- KENYON L. BUTTERFIELD, A. M., LL.D., President's House
President of the College and Head of Division of
Rural Social Science.
- GEORGE F. MILLS, A. M., 46 Amity Street
Dean of the College and Professor of Languages
and Literature.
- CHARLES F. FERNALD, Ph.D., 3 Hallock Street
Honorary Director of the Graduate School.
- WILLIAM P. BROOKS, Ph. D., 28 Northampton Road
Director of the Experiment Station and Lecturer
on Soil Fertility.
- WILLIAM D. HURD, M. Agr., 82 Pleasant Street
Director of Extension Work.
- FRANK A. WAUGH, M. Sc., M. A. C.
Head of Division of Horticulture and Professor of
Landscape Gardening.
- JAMES A. FOORD, M. Sc., Nutting Avenue
Head of Division of Agriculture and Professor of
Farm Administration.
- ROBERT J. SPRAGUE, Ph., D.,
Head of Division of the Humanities and Professor
of Economics and Sociology.
- JOSEPH B. LINDSEY, Ph. D., 47 Lincoln Avenue
Goessmann Professor of Chemistry.
- CHARLES WELLINGTON, Ph. D., 34 Amity Street
Professor of Chemistry.
- JAMES B. PAIGE, B. Sc., D. V. S., 42 Lincoln Avenue
Professor of Veterinary Science.
- GEORGE E. STONE, Ph. D., Mount Pleasant
Professor of Botany.
- PHILIP B. HASBROUCK, B. Sc., 130 Pleasant Street
Professor of Physics and Registrar of the College.
- JOHN E. OSTRANDER, A. M., C. E., 33 North Prospect Street
Professor of Mathematics and Civil Engineering.
- HENRY T. FERNALD, Ph. D., 44 Amity Street
Professor of Entomology and Acting Director of the
Graduate School.
- GEORGE C. MARTIN, C. E., Captain 18th U. S. Infantry,
Professor of Military Science and Tactics.
35 North Prospect Street
- EDWARD A. WHITE, B. S., Mount Pleasant
Professor of Floriculture.

WILLIAM R. HART, A. M., Professor of Agricultural Education.	97 Pleasant Street
FRED C. SEARS, M. Sc., Professor of Pomology.	Mount Pleasant
FRED C. KENNEY, Treasurer of the College.	Mount Pleasant
ROBERT W. NEAL, A. M., Associate Professor of English.	Woodside Avenue
JOSEPH S. CHAMBERLAIN, Ph. D., Associate Professor of Organic and Agricultural Chemistry	16 North Prospect Street
WILLIAM P. B. LOCKWOOD, B. Sc. Agr., Associate Professor of Dairying.	5 East Pleasant Street
ELMER K. EYERLY, A. M., Associate Professor of Rural Sociology.	Amity Street
FREDERICK F. MOON, A. B., M. F., Associate Professor of Forestry.	6 Allen Street
JOHN A. McLEAN, A. B., B. Sc. Agr., Associate Professor of Animal Husbandry.	Prospect House
JOHN C. GRAHAM, B. Sc., Associate Professor of Poultry Husbandry.	North Amherst
GUY C. CRAMPTON, Ph. D., Associate Professor of Entomology.	9 Philips Street
*S. FRANCIS HOWARD, M. Sc., Assistant Professor of Chemistry.	10 Allen Street
A. VINCENT OSMUN, M. Sc., Assistant Professor of Botany.	North Amherst
SIDNEY B. HASKELL, B. Sc., Assistant Professor of Agronomy.	5 Fearing Street
CLARENCE E. GORDON, Ph. D., Assistant Professor of Zoology and Geology.	Nutting Avenue
FLOYD B. JENKS, B. Sc. Agr., Assistant Professor of Agricultural Education.	12 Cottage Street
EDGAR L. ASHLEY, A. M., Assistant Professor of German.	Prospect House
ANDERSON A. MACKIMMIE, A. B., Assistant Professor of French.	Nutting Avenue
ALEXANDER E. CANCE, Ph. D., Assistant Professor of Agricultural Economics.	9 Fearing Street
FREDERICK B. McKAY, A. B., . . . Assistant Professor of English and Public Speaking.	15 Fearing Street
BURTON N. GATES, Ph. D., Assistant Professor of Beekeeping.	42 Lincoln Avenue
EDWARD M. LEWIS, A. M., Assistant Professor of English and Assistant Dean of the College.	Amity Street

*On leave of absence.

CHARLES A. PETERS, Ph. D.,	6 High Street
Assistant Professor of Inorganic and Soil Chem-	
istry.	
CURRY S. HICKS, B. Sc.,	8 Allen Street
Assistant Professor of Physical Education and	
Hygiene.	
FREDERICK L. YEAW, B. Sc.,	
Assistant Professor of Market Gardening.	
GEORGE S. GAGE, Ph. D.,	
Assistant Professor of Animal Pathology.	
GEORGE N. HOLCOMB, A. B., S. T. B.,	
Lecturer in History.	
FRANK W. RANE, M. F.,	Boston
Lecturer in Forestry.	
C. ROBERT DUNCAN, B. Sc.,	North Prospect Street
Instructor in Mathematics.	
CHARLES R. GREEN, B. Agr.,	Mount Pleasant
Librarian.	
ALVAH J. NORMAN, M. Sc.,	7 Philips Street
Extension Instructor in Pomology.	
GEORGE F. E. STORY, B. Sc.,	10 Allen Street
Extension Instructor in Dairying.	
ARTHUR K. HARRISON,	8 Allen Street
Instructor in Landscape Gardening.	
CHESTER A. BUTMAN, B. Sc.,	
Instructor in Physics.	
WILLARD A. WATTLES, A. M.,	
Instructor in English.	
WILLIAM L. HARMOUNT, A. B.,	
Instructor in French.	
ALBERT GRAUER, A. M.,	
Instructor in German.	
ELVIN L. QUAIFFE, B. Sc. Agr.,	
Instructor in Animal Husbandry.	
WILLIAM L. MACHMER, A. M.,	Kendrick Place
Instructor in Mathematics.	
WILLARD A. TURNER, Ph. B.,	
Assistant in Chemistry.	
HELENA GOESSMANN, Ph. M.,	Amity Street
Assistant in English.	
SAMUEL R. PARSONS, B. Sc.,	9 Fearing Street
Assistant in Mathematics and in Military Science.	
FREDERICK A. McLAUGHLIN, B. Sc.,	
Assistant in Botany.	
HERBERT J. BAKER, B. Sc.,	
Assistant in Agronomy.	

Abstract of Courses to be Offered in 1911-12

(Odd numbers indicate first semester courses; even numbers, second semester. When no description is given, the course will be found sufficiently described in the catalog of 1910-11. The announcements here made are subject to such modification as may be rendered necessary by the exigencies of administration. Unless otherwise specified, elective courses are open to both juniors and seniors.)

Division of Agriculture

PROFESSOR FOORD.

Required Courses

2. ELEMENTARY AGRICULTURE—Animal Husbandry 2 takes the place of this course.

Elective Courses

3. AGRICULTURAL SEMINAR— PROFESSOR FOORD

AGRONOMY

ASSISTANT PROFESSOR HASKELL, DR. BROOKS, MR. BAKER.

Required Course

1. SOILS AND FERTILIZERS—
ASSISTANT PROFESSOR HASKELL.
3. FIELD AND FORAGE CROPS—
ASSISTANT PROFESSOR HASKELL.
4. FIELD CROP IMPROVEMENT—This course takes up the question of breeding and improvement of the crops studied in Agronomy 3; study of seed stock as offered in the market, testing of germination, purity, and estimation of the valuation of the same; and the methods of production, harvesting and curing. Prerequisites, Agronomy 3, Botany 2; juniors and seniors; one laboratory period and two lecture periods weekly. Credit 3. ASSISTANT PROFESSOR HASKELL.
5. ADVANCED SOILS—A field, laboratory and lecture course on soils. Their nature, composition, physical qualities, improvement. Field work, as far as the season allows, consists

of detailed soil surveys in different parts of the Connecticut Valley; this followed by laboratory work on the physical properties of the soil collected, on the effect of fertilizers on the soil, and on the mixing of fertilizer. Prerequisites, Agronomy 1, Chemistry 2; juniors and seniors; one four hour laboratory period weekly. Credit 3.

ASSISTANT PROFESSOR HASKELL.

6. DRAINAGE AND IRRIGATION—A field and lecture course on soil improvement, by drainage and irrigation. As a thesis each man is required to take an area of wet or swampy land and to present plans and estimates for its reclamation. Prerequisites, Agronomy 1, Mathematics 8, juniors and seniors; one four hour laboratory period and one lecture period weekly. Credit 3. ASSISTANT PROFESSOR HASKELL.
8. MANURES AND FERTILIZERS— DR. BROOKS

ANIMAL HUSBANDRY

ASSOCIATE PROFESSOR McLEAN, MR. QUAIFE.

Required Courses

2. ELEMENTARY JUDGING—A study of the different market classes and grades of horses, cattle, sheep and swine. The purpose of this course is to familiarize beginners with the different classes of stock, and to give them a grounding in live stock judging. Text—Craig's Live Stock Judging—Two judging laboratories each week, Freshmen. Credit 2.

ASSOCIATE PROFESSOR McLEAN AND MR. QUAIFE.

Elective Courses

4. BREEDS AND TYPES OF LIVE STOCK—A course covering the origin, history, development and characteristics of the different breeds of horses, cattle, sheep and swine. One lecture, two laboratories a week. Prerequisite, Animal Husbandry 2. Text—Plumb's Breeds and Types of Farm Animals. Sophomores. Credit 3.

ASSOCIATE PROFESSOR McLEAN AND MR. QUAIFE.

5. PRINCIPLES OF BREEDING—Prerequisite, Animal Husbandry 4, and Elementary Zoology. Text—Thompson's Heredity. Two lectures per week. Juniors. Credit 2.

ASSOCIATE PROFESSOR McLEAN.

7. LIVE STOCK MANAGEMENT—A course upon the feeding, care and management of all classes of live stock throughout the different seasons; the construction of cattle stables, hog houses, sheep pens and horse barns will be dealt with; the care of the pregnant animal previous to, during, and after parturition; the care of young stock, of sires, and in short, all phases of live stock management. In laboratory, halter breaking, harnessing, driving, breaking to drive, casting, fit-

ting for show, and the various other phases of horse management will be taken up. Similarly the practical phases of cattle, sheep and swine management will be fully treated. Two lectures and one laboratory. Juniors. Prerequisite, Animal Husbandry 4. Credit 3. Mr. QUAIFFE.

8. **ADVANCED STOCK JUDGING**—This course is designed to equip Animal Husbandry students in the judging of classes of different types of live stock, to strengthen them in the selection of superior sires, and equip them for stock judging at fairs. Visits will be made to the best herds of the various breeds of stock in the state. Judging teams to represent the college will be largely selected from this class. Prerequisite, Animal Husbandry 4. Two laboratory periods, Juniors. Credit 2. ASSOCIATE PROFESSOR McLEAN.
10. **FEEDS AND FEEDING**—A study of the principles of animal nutrition and the methods of horse feeding, and feeding for the production of beef, pork, mutton, wool and milk. Text—Henry's Feeds and Feeding. Prerequisite, Animal Husbandry 4, five lectures per week. Seniors. Credit 3. ASSOCIATE PROFESSOR McLEAN.
11. **HERD AND STUD BOOK STUDY**—An advanced course of the study of the breeds of live stock, familiarizing the student with the most productive sires, and dams of the various breeds, and the successful lines and methods of breeding. Prerequisites, Animal Husbandry 5 and 8. Two hours per week. Seniors. Credit 2. ASSOCIATE PROFESSOR McLEAN.

DAIRYING

ASSOCIATE PROFESSOR LOCKWOOD, MR. STORY.

Elective Courses

1. **MILK AND ITS COMPOSITION**—
ASSOCIATE PROFESSOR LOCKWOOD
2. **MARKET MILK**—
ASSOCIATE PROFESSOR LOCKWOOD
3. **BUTTER MAKING**—
ASSOCIATE PROFESSOR LOCKWOOD
4. **MANUFACTURED MILK PRODUCTS**—
ASSOCIATE PROFESSOR LOCKWOOD

FARM ADMINISTRATION

PROFESSOR FOORD.

Elective Courses

3. **FARM EQUIPMENT**—
PROFESSOR FOORD
4. **FARM MANAGEMENT**—
PROFESSOR FOORD

POULTRY HUSBANDRY

ASSOCIATE PROFESSOR GRAHAM.

Elective Courses

1. ELEMENTS OF POULTRY CULTURE—This course consists of a comprehensive study of poultry house construction, poultry house equipment, winter egg production, breeds and types of poultry; two lectures, two credits.
ASSOCIATE PROFESSOR GRAHAM.
2. ELEMENTS OF POULTRY CULTURE—This is a continuation of Course 1, treating the subjects of incubation, brooding, care of growing stock, market poultry, including capons, roasters and broilers, and diseases of poultry; two lectures, two credits. ASSOCIATE PROFESSOR GRAHAM.
3. POULTRY PRACTICE WORK—This is a practical laboratory course in caponizing, killing and picking, dressing and packing poultry, also sorting and preparing eggs for market. Must be preceded by or accompanied by Course 1. One laboratory period, one credit.
ASSOCIATE PROFESSOR GRAHAM.
4. INCUBATION AND BROODING—In this course students are required to set up and operate incubators and brooders, make a systematic study of the development of the chick in the egg, and the care of sitting hens. This course must be preceded or accompanied by Course 2. One to three credits. Time to be arranged.
ASSOCIATE PROFESSOR GRAHAM.
5. PEN MANAGEMENT—This is a practical laboratory course. Students are required to care for a pen of fowls, keeping accurate records of eggs produced, food consumed, weather conditions, health of fowls, and profit and loss. Prerequisite, Course 1, one credit. Time to be arranged.
ASSOCIATE PROFESSOR GRAHAM.
6. POULTRY MANAGEMENT—Not given in 1911-12.
7. ADVANCED POULTRY JUDGING—Not given in 1911-12.

Division of Horticulture

PROFESSOR WAUGH.

Required Courses (General)

2. NURSERY PRACTICE— MR. NORMAN

Elective Courses (General)

3. PLANT MATERIALS— PROFESSOR WHITE
4. PLANT MATERIALS— PROFESSOR WHITE
6. PLANT BREEDING—Not given in 1911-12.

FLORICULTURE

PROFESSOR WHITE.

Elective Courses

1. GREENHOUSE MANAGEMENT— PROFESSOR WHITE
2. GREENHOUSE DESIGN AND CONSTRUCTION—
PROFESSOR WHITE
3. FALL GREENHOUSE CROPS— PROFESSOR WHITE
4. SPRING GREENHOUSE CROPS— PROFESSOR WHITE

FORESTRY

ASSOCIATE PROFESSOR MOON, MR. RANE.

Elective Courses

1. DENDROLOGY AND SILVICULTURE—
ASSOCIATE PROFESSOR MOON
2. DENDROLOGY AND SILVICULTURE—
ASSOCIATE PROFESSOR MOON
- 3, 4. ADVANCED FORESTRY—An advanced course in Forestry open to Seniors who have had Forestry 1 and 2. It will include forest mensuration and finance, wood technology and preservation briefly. Lumbering with especial attention to New England methods will be considered, and finally a scheme of management for an assigned tract of forest worked out by each student. 3 hours, Credit 3.
ASSOCIATE PROFESSOR MOON

LANDSCAPE GARDENING

PROFESSOR WAUGH, MR. HARRISON, ———

Elective Courses

1. ELEMENTS OF LANDSCAPE GARDENING—
MR. HARRISON
2. ELEMENTS OF LANDSCAPE GARDENING—
MR. HARRISON
3. GENERAL LANDSCAPE GARDENING—
PROFESSOR WAUGH
4. GENERAL LANDSCAPE GARDENING—
PROFESSOR WAUGH
5. THEORY OF LANDSCAPE ART— PROFESSOR WAUGH
6. CONSTRUCTION AND MAINTENANCE—Detailed instruction in methods of construction, planting, carrying out plans, organization, reporting, accounting, etc.; maintenance work in parks and estates, its organization, management, cost, etc. 2 hours. Credit 2.
MR. HARRISON
7. CIVIC ART— PROFESSOR WAUGH
8. CIVIC ART— PROFESSOR WAUGH

MARKET GARDENING

ASSISTANT PROFESSOR YEAW.

Elective Courses

2. ELEMENTS OF MARKET GARDENING—
ASSISTANT PROFESSOR YEAW
3. ADVANCED MARKET GARDENING—
ASSISTANT PROFESSOR YEAW

POMOLOGY

PROFESSOR SEARS, MR. NORMAN.

Elective Courses

- | | |
|-------------------------|-----------------|
| 1. PRACTICAL POMOLOGY— | PROFESSOR SEARS |
| 2. PRACTICAL POMOLOGY— | PROFESSOR SEARS |
| 3. SYSTEMATIC POMOLOGY— | PROFESSOR SEARS |
| 4. COMMERCIAL POMOLOGY— | PROFESSOR SEARS |

DRAWING

MR. HARRISON.

Elective Courses

- | | |
|------------------------|--------------|
| 1. FREEHAND DRAWING— | MR. HARRISON |
| 2. MECHANICAL DRAWING— | MR. HARRISON |

Division of Science

CHAIRMAN TO BE ELECTED.

BOTANY

PROFESSOR STONE, ASSISTANT PROFESSOR OSMUN, MR. McLAUGHLIN.

Required Courses

2. HISTOLOGY, PHYSIOLOGY, MORPHOLOGY AND
CLASSIFICATION OF PLANTS—

ASSISTANT PROFESSOR OSMUN

Elective Courses

- | | |
|------------------------|---|
| 3. CRYPTOGAMIC BOTANY— | |
| | ASSISTANT PROFESSOR OSMUN |
| 4. CRYPTOGAMIC BOTANY— | |
| | ASSISTANT PROFESSOR OSMUN |
| 5. PLANT PATHOLOGY— | |
| | PROFESSOR STONE AND ASSISTANT PROFESSOR OSMUN |
| 7. PLANT PATHOLOGY— | PROFESSOR STONE |
| 8. PLANT PATHOLOGY— | PROFESSOR STONE |
| 9. ECONOMIC FUNGI— | PROFESSOR STONE |

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|--|-----------------|
| 10. ECONOMIC FUNGI— | PROFESSOR STONE |
| 11. PLANT PHYSIOLOGY— | PROFESSOR STONE |
| 12. PLANT PHYSIOLOGY— | PROFESSOR STONE |
| 13. PHYSIOLOGY AND PATHOLOGY OF SHADE TREES— | PROFESSOR STONE |
| 14. PHYSIOLOGY AND PATHOLOGY OF SHADE TREES— | PROFESSOR STONE |

GENERAL AND AGRICULTURAL CHEMISTRY

PROFESSOR LINDSEY, PROFESSOR WELLINGTON, ASSOCIATE PROFESSOR
CHAMBERLAIN, ASSISTANT PROFESSOR PETERS,
MR. TURNER, MR. ADAMS.

Required Courses

1. THE NON-METALS—
ASSISTANT PROFESSOR PETERS, MR. ADAMS
2. THE COMMON METALS—
ASSISTANT PROFESSOR PETERS, MR. ADAMS

Elective Courses

3. Not given in 1911-12.
4. QUALITATIVE ANALYSIS—
ASSISTANT PROFESSOR PETERS AND MR. ADAMS
5. ORGANIC CHEMISTRY—
ASSOCIATE PROFESSOR CHAMBERLAIN
6. ORGANIC CHEMISTRY—
ASSOCIATE PROFESSOR CHAMBERLAIN
7. AGRICULTURAL CHEMISTRY—
ASSOCIATE PROFESSOR CHAMBERLAIN
8. AGRICULTURAL CHEMISTRY—
ASSOCIATE PROFESSOR CHAMBERLAIN
9. QUANTITATIVE ANALYSIS—
PROFESSOR WELLINGTON AND MR. TURNER
10. QUANTITATIVE ANALYSIS—
PROFESSOR WELLINGTON AND MR. TURNER
13. PHYSIOLOGICAL CHEMISTRY—
ASSOCIATE PROFESSOR CHAMBERLAIN
14. PHYSIOLOGICAL CHEMISTRY—
ASSOCIATE PROFESSOR CHAMBERLAIN
15. Not given.
- 17, 18. AGRICULTURAL CHEMICAL ANALYSIS—Courses
17 and 18 may be best described under the following heads.
The different divisions are not, however, separate courses,

but together make up the work of the two semesters in agricultural chemical analysis.

(a) Analysis of fertilizers, insecticides and fungicides.

The theory with a reasonable amount of practice in the subject, is given under the direct supervision of the professor in charge. The methods followed are in the first place comparative; then the preferred official methods are closely studied, especially with reference to their limitations.

(b) Analysis of agricultural soils.

The more important characteristics and ingredients in a few pronounced types of agricultural soils are determined and the student is encouraged to give further study to this line of work in an advanced or post-graduate course.

(c) Analysis of cattle feeds and dairy products.

A few of the more important coarse and concentrated feeds are prepared for analysis and analyzed, and by means of occasional lectures and discussions their relative merits, as sources of nutrition are pointed out. The more prominent constituents in fresh and sour milk, cream, butter and cheese, are determined and a few of the more ordinary adulterations detected.

(d) Sugar analysis.

An introductory study to the chemistry of sugar making and refining, including the determination of sugar solutions of known strength by volumetric and gravimetric processes as well as by the aid of the polariscope.

Prerequisites, Courses 1, 2, 4, 9 and 10. Seniors: Lecture 1 hour, laboratory 8 hours. Credit 5.

PROFESSOR WELLINGTON AND MR. TURNER

19. Not given.

ENTOMOLOGY

PROFESSOR FERNALD, ASSOCIATE PROFESSOR CRAMPTON, ASSISTANT

PROFESSOR GATES, MR. REGAN.

Elective Courses

- 1, 2. GENERAL AND ECONOMIC ENTOMOLOGY—
Course 1 comprises a general introduction to the study of insects, including studies on their structure as applied to their identification; the principles of classification; a systematic examination of the different groups and of the most important economic insects of each group, including their life histories and habits, recognition of their work as shown in the collections, and methods for their control. The most important

insecticides and their preparation and application are also treated. Juniors, three lecture periods. Students electing Course 1 must also take Course 2. Credit 3.

PROFESSOR FERNALD.

Course 2 is made up of laboratory and field work on the structure, habits and life histories of insects, examination of their work, methods of collecting, preserving, preparing insects for collections and classifying them. A continuation of Course 1. Two 2-hour laboratory periods. Credit 2.

PROFESSOR FERNALD AND MR. REGAN.

3. ADVANCED ENTOMOLOGY—

PROFESSOR FERNALD, ASSOCIATE PROFESSOR CRAMPTON
AND MR. REGAN.

4. ADVANCED ENTOMOLOGY—

PROFESSOR FERNALD, ASSOCIATE PROFESSOR CRAMPTON
AND MR. REGAN.

5. FOREST INSECTS—A study of insects injurious to forest trees and of methods for their control, with laboratory and field work on these insects and a study of what has been published about them. Seniors. Prerequisites, Entomology 1 and 2. One lecture and two two-hour laboratory field exercises. Credit 3.

PROFESSOR FERNALD.

8. BEE KEEPING—This course comprises a general consideration of the biology of the honey bee and of practical bee keeping. Some topics covered are: Phylogeny, life history, general behavior and instincts, structure, products, relations of bees to plants and the honey flora. The course aims particularly to afford first-hand, practical experience with bees, to the end of enabling their proper maintenance for any purpose, horticultural, educational, or apicultural. Special emphasis is given to the most modern methods of manipulation, for comb or extracted honey production, wax production, bee production, queen rearing, orchard and horticultural purposes. Bee diseases, a thorough understanding of which is fundamental to the industry, are considered in detail. So far as possible the work is made individual, in constructing materials and apparatus, as well as in manipulating the bees, a colony being assigned to each student. Seniors; Juniors may elect. Course 2 is a desirable preparation; 2 one-hour lectures; 1 two-hour laboratory period. Credit 3.

ASSISTANT PROFESSOR GATES.

MATHEMATICS AND CIVIL ENGINEERING

PROFESSOR OSTRANDER, MR. DUNCAN, MR. MACHMER, MR. PARSONS.

Required Courses

1. HIGHER ALGEBRA—MR. MACHMER AND MR. PARSONS

2. HIGHER ALGEBRA—MR. MACHMER AND MR. PARSONS
3. SOLID GEOMETRY—MR. DUNCAN
4. PLANE TRIGONOMETRY—PROFESSOR HASBROUCK

Elective Courses

8. PLANE SURVEYING—MR. DUNCAN
7. ANALYTIC GEOMETRY—PROFESSOR OSTRANDER
10. DIFFERENTIAL AND INTEGRAL CALCULUS—PROFESSOR OSTRANDER
11. HYDRAULICS AND SANITARY ENGINEERING—PROFESSOR OSTRANDER
12. ADVANCED SURVEYING—PROFESSOR OSTRANDER
15. ANALYTIC MECHANICS—PROFESSOR OSTRANDER

PHYSICS

PROFESSOR HASBROUCK, CAPTAIN MARTIN, MR. BUTMAN.

Required Courses

1. GENERAL PHYSICS—PROFESSOR HASBROUCK AND MR. BUTMAN

Elective Courses

2. GENERAL PHYSICS—MR. BUTMAN
3. OPTICAL INSTRUMENTS AND LIGHT—Three hour lecture course open to Juniors and Seniors. 3 hours. Credit 3. MR. BUTMAN.
4. ELECTRICITY AND HEAT—Three hour lecture and laboratory course open to Juniors and Seniors. 3 hours. Credit 3. MR. BUTMAN.

[MATHEMATICS 4 (trigonometry) is, for convenience of grouping, listed under Mathematics, although in charge of the Department of Physics.]

VETERINARY SCIENCE

PROFESSOR PAIGE, ASSISTANT PROFESSOR GAGE.

Elective Courses

1. INTRODUCTORY BACTERIOLOGY—PROFESSOR PAIGE AND ASSISTANT PROFESSOR GAGE
2. BACTERIOLOGY—A continuation of Course 1, taking up more advanced problems. PROFESSOR PAIGE AND ASSISTANT PROFESSOR GAGE
3. VETERINARY SCIENCE—PROFESSOR PAIGE
4. VETERINARY SCIENCE—PROFESSOR PAIGE

ZOOLOGY AND GEOLOGY

ASSISTANT PROFESSOR GORDON, MR. McLAINE.

ZOOLOGY

Required Courses

1. ELEMENTARY ZOOLOGY—

ASSISTANT PROFESSOR GORDON

Elective Courses

3. INVERTEBRATE ZOOLOGY—

ASSISTANT PROFESSOR GORDON

4. VERTEBRATE ZOOLOGY—

ASSISTANT PROFESSOR GORDON

5. ANIMAL PARASITES—

ASSISTANT PROFESSOR GORDON

6. ANIMAL PARASITES—

ASSISTANT PROFESSOR GORDON

- 7, 8 and 9. ADVANCED ZOOLOGY—

ASSISTANT PROFESSOR GORDON

GEOLOGY

Elective Courses

2. GENERAL GEOLOGY—

ASSISTANT PROFESSOR GORDON

Division of the Humanities

PROFESSOR SPRAGUE.

ECONOMICS AND SOCIOLOGY

PROFESSOR SPRAGUE.

Required Course

1. POLITICAL ECONOMY—An introductory course. A study of the nature and scope of economics; the evolution and organization of the present economic system, the principles of production, exchange and consumption. This course will take up such topics as value, rentals, population, labor and its problems, capital, interest and profits, systems and factors of production, tariffs and commerce. Students will be called upon to analyze industrial plants in actual operation. Text books, lectures and general discussions; a required course, but it may be taken in either Junior or Senior year; 3 hours. Credit 3.

PROFESSOR SPRAGUE.

Elective Courses

2. INDUSTRIAL PROBLEMS—A course in important economic questions of the time, following Economics 1. The

problems covered will be labor, transportation, taxation, etc. Lectures, assigned readings, and reports. 3 hours. Credit 3.

PROFESSOR SPRAGUE.

3. **SOCIAL INSTITUTIONS AND SOCIAL PROBLEMS**—This course is devoted to the study of the social institutions, such as the family, the church, state and property; and to such current social problems as divorces, race suicide, crime and prison reform, poverty and its relief, social effects of low wages, child labor, overwork, immigration and congestion of population. The later weeks of the semester will be given to a short introduction to sociological theory. The correctional and charitable institutions of Massachusetts will be studied in considerable detail. Readings, lectures, papers; 3 hours. Credit 3.

PROFESSOR SPRAGUE.

4. **MODERN SOCIAL REFORM MOVEMENTS**—The history of property and its vital issues in modern times. The socialistic systems, anarchy, and communism. Systems of workingmen's insurance in Europe and America, and other methods of relief from the chances of life. Educational reforms, in process, to meet the demands of a new age, and legislative remedies for the evils of social change and maladjustment. The crisis of Christianity under modern capitalized industrialism. These topics indicate the nature of the subjects studied. This course follows Economics 3. Three hours. Credit 3.

PROFESSOR SPRAGUE.

5. **PUBLIC FINANCE, MONEY AND BANKING**—This course follows Economics 1. It will take up taxation and the various systems for collecting public revenue in Europe and America, with the problems involved; the history of money and the systems of banking and finance now in operation; the causes and problems of economic crises and depressions; the currency problems of the United States. Readings, lectures and discussions. 3 hours. Credit 3.

PROFESSOR SPRAGUE.

6. **ECONOMIC HISTORY**—This course will be divided between the economic history of Europe and that of America. An outline history will be followed with special study of selected epochal periods and important topics. 3 hours. Credit 3.

PROFESSOR SPRAGUE.

8. **ANTHROPOLOGY; THE HISTORY OF HUMAN CIVILIZATION**—The evolutionary origin and history of man; characteristics of primitive men, departure from the animal status, and the beginnings of civilization; development of industries, arts, and sciences; the growth of languages, warfare, migrations, and social institutions; a study of the powerful natural and human forces that have brought man

from the early stages to modern conditions, will constitute the subject matter of the course. For Seniors only. Three hours. Credit 3. PROFESSOR SPRAGUE.

HISTORY AND GOVERNMENT

ASSOCIATE PROFESSOR EYERLY, MR. HOLCOMB.

Elective Courses

1. ELEMENTS OF POLITICAL SCIENCE—Nature and scope of political science; origin and evolution of the state; systems of government in the principal European states; organization and working of the national and of the state governments of the United States; relation of government to political parties and to public opinion; the functions of government as related to labor and commerce. 3 hours. Credit 3.

ASSOCIATE PROFESSOR EYERLY.

2. LOCAL POLITICAL INSTITUTIONS—A comparative study of the organization, functions and achievements of country and city groups, especially as these are concerned with such matters as taxation, finance, licenses, franchises, public ownership, highways, transportation and communication, water supply, fire protection, public lighting, markets, food inspection, garbage and sewage disposal, infectious diseases, housing conditions, police force, parks and playgrounds, libraries, schools, care of dependents. 3 hours. Credit 3.

ASSOCIATE PROFESSOR EYERLY.

3. THE HISTORY OF NEW ENGLAND—In this course, New England is regarded as a unit. Although the history of agriculture and rural life is treated with special fulness, ample attention is given to political, religious and ethical history. It is hoped that the student will not only be led to an intelligent understanding of present economic conditions, but will also be imbued with a progressive loyalty to the highest ideals of the New England of the past. Lectures and required reading; 3 hours. Credit 3. MR.. HOLCOMB.

5. THE HISTORY OF IDEALS—This course treats history from the idealistic, rather than from the economic, point of view. It attempts to define the great ideals which have impelled some of the most important social, political, esthetic, scientific, ethical and religious movements of medieval and modern history, and to trace the causes of the success or failure of the movements to which these ideals have led. Christianity, including monasticism, modern Catholicism and Protestantism; medieval art and architecture; the modern scientific movement; and social and political democracy will be treated historically from this point of view. Lectures and reading; 3 hours. Credit 3. MR. HOLCOMB.

Languages and Literature

PROFESSOR MILLS.

LANGUAGES AND LITERATURE: ENGLISH

ASSOCIATE PROFESSOR NEAL, ASSISTANT PROFESSOR MCKAY, ASSISTANT PROFESSOR LEWIS, MR. WATTLES, MISS GOESSMANN, MR. GREEN.

Required Courses (English Language)

- 1, 2. FRESHMAN ENGLISH—ASSOCIATE PROFESSOR NEAL, ASSISTANT PROFESSOR MCKAY, MR. WATTLES, MISS GOESSMANN.
3. SOPHOMORE ENGLISH—All sophomores. See "A" below. ASSISTANT PROFESSOR LEWIS, MR. WATTLES.
4. SOPHOMORE ENGLISH—All sophomores except those excused under Department rules. MR. WATTLES.
- A. USE OF LIBRARY—Required of all sophomores as part of course 3. MR. GREEN.

Elective Courses (English Language)

(TEACHERS' TRAINING COURSES: In English Language and Literature, a group of courses will hereafter be offered intended especially for students who contemplate teaching and wish to qualify for positions that call for the teaching of English, either by itself or in association with some branch of science. This group at present will consist of courses 7, 8, and 17 in English Language, and courses 11, 12, and 18 in English Literature.)

- 7, 8. COMPOSITION TRAINING COURSES—Students will follow the work of the classes in English 1-2, and will have personal charge of small groups of freshmen for the criticism of themes and other instruction. They must be able to arrange hours for attending recitations in the freshman courses. Study of more advanced theory will be provided in assigned readings. Primarily for juniors (or sophomores with advanced standing), but open to seniors. Student readers must before appointment have passed one or both of these courses. Three hours. Credit 3.

ASSOCIATE PROFESSOR NEAL, ASSISTANT PROFESSOR MCKAY, MR. WATTLES.

9. JOURNALISM—9B. *Introduction to Journalism*: The first semester course introduces the student to foundation conceptions and aims of journalism, and gives practice in simple forms of journalistic writing. It is preparatory to all other work in journalism. Course 9A will not be given this year. ASSOCIATE PROFESSOR NEAL.
10. JOURNALISM—10A and B. *Reporting*: News-gathering and news writing. This includes the gathering and present-

ing of agricultural information as a branch of reporting. Members of the class will need free time for covering assignments. Those who have not had course 9B will be given additional work. ASSOCIATE PROFESSOR NEAL.

(NOTE—Courses 9 and 10 are preliminary courses, and should precede more advanced work, such, for instance, as specialized work in agricultural journalism.)

17. ADVANCED COMPOSITION—Not given in 1911-12.

Elective Courses (English Literature)

9, 10. CULTURAL READING—(The number of Departments under the direction of which reading may be done will be lessened.)

13. ENGLISH WRITERS AND THOUGHT—Studies, laboratory problems, readings, reports; Chaucer to the sixteenth century. Three hours. Credit 3.

ASSOCIATE PROFESSOR NEAL.

14. ENGLISH WRITERS AND THOUGHT—The sixteenth century to Shakspeare. Three hours. Credit 3.

ASSOCIATE PROFESSOR NEAL.

15, 16. ENGLISH LANGUAGE AND LITERATURE—

ASSISTANT PROFESSOR LEWIS.

18. ADVANCED LITERATURE—Readings and laboratory problems; Tennyson. Three hours. Credit 3.

ASSOCIATE PROFESSOR NEAL.

LANGUAGES AND LITERATURE: PUBLIC SPEAKING

ASSISTANT PROFESSOR MCKAY.

Required Courses

1. FRESHMAN PUBLIC SPEAKING—

ASSISTANT PROFESSOR MCKAY

2. FRESHMAN PUBLIC SPEAKING—

ASSISTANT PROFESSOR MCKAY

Elective Courses

8. ORATORY—

ASSISTANT PROFESSOR MCKAY

9. DEBATING—

ASSISTANT PROFESSOR MCKAY

10. DRAMATIC READING— ASSISTANT PROFESSOR MCKAY

LANGUAGES AND LITERATURE: GERMAN

ASSISTANT PROFESSOR ASHLEY, MR. GRAUER.

Required Courses

1. ELEMENTARY GERMAN

MR. GRAUER

2. ELEMENTARY GERMAN—

MR. GRAUER

3. INTERMEDIATE GERMAN—

ASSISTANT PROFESSOR ASHLEY

- 3A. INTERMEDIATE GERMAN— MR. GRAUER
4. INTERMEDIATE GERMAN—

ASSISTANT PROFESSOR ASHLEY

- 4A. INTERMEDIATE GERMAN— MR. GRAUER

- 5 ADVANCED GERMAN— ASSISTANT PROFESSOR ASHLEY

Elective Courses

- 6 ADVANCED GERMAN— ASSISTANT PROFESSOR ASHLEY

7. MODERN GERMAN— ASSISTANT PROFESSOR ASHLEY

8. MODERN GERMAN— ASSISTANT PROFESSOR ASHLEY

9. SCIENTIFIC GERMAN—Reading of modern magazine articles and works in German of a scientific nature. Different work assigned according to needs of individual students. Open to Juniors who have completed course 4A or more advanced work. 3 hours. Credit 3.

ASSISTANT PROFESSOR ASHLEY.

10. SCIENTIFIC GERMAN—As stated under Course 9.

ASSISTANT PROFESSOR ASHLEY

11. GERMAN LITERATURE—Advanced language and literary study. Conducted entirely in German. Lectures on German Literature and History; life, customs and travel in Germany. Collateral readings, including masterpieces of different epochs, such as *Nibelungenlied*, Goethe's *Faust*, and one modern typical drama. Prerequisite, Course 6 or 10.

ASSISTANT PROFESSOR ASHLEY.

12. GERMAN LITERATURE—As stated under Course 11.

ASSISTANT PROFESSOR ASHLEY

LANGUAGES AND LITERATURE: FRENCH

ASSISTANT PROFESSOR MACKIMMIE, MR. HARMOUNT.

Required Courses

1. ELEMENTARY FRENCH— MR. HARMOUNT

2. ELEMENTARY FRENCH— MR. HARMOUNT

3. INTERMEDIATE FRENCH—

ASSISTANT PROFESSOR MACKIMMIE, MR. HARMOUNT

4. INTERMEDIATE FRENCH—

ASSISTANT PROFESSOR MACKIMMIE, MR. HARMOUNT

5. ADVANCED FRENCH—

ASSISTANT PROFESSOR MACKIMMIE, MR. HARMOUNT

Elective Courses

6. ADVANCED FRENCH—

ASSISTANT PROFESSOR MACKIMMIE, MR. HARMOUNT

- 7, 8. SCIENTIFIC FRENCH—This course is intended to continue and enlarge the scientific readings begun in the

freshman and sophomore years. It will consist of the reading of a scientific reader, outside readings and reports, and the careful reading of some recent work or series of articles in the subject in which the student is taking his major. Prerequisite, the required French or its equivalent. Intended principally for Juniors. 3 hours. Credit 3.

MR. HARMOUNT.

- 9, 10. FRENCH LITERATURE FROM 1852—The outline is intended as a suggestion. The exact subject matter of the course will be determined when the men are enrolled. The object of this course is to give an introduction to the movements of French literature in the past fifty years. In the drama readings from Augier, A. Dumas, fils, Delavigne; in the novel from Flaubert, the de Concourts, Zola; in criticism from Taine, Renan and Sainte Beuve; for the literary history of the period Lanson's *Histoire de la littérature française*. Prerequisite, the required French. Juniors or Seniors. 3 hours. Credit 3.

ASSISTANT PROFESSOR MACKIMMIE.

LANGUAGES AND LITERATURE: SPANISH

ASSISTANT PROFESSOR MACKIMMIE.

Elective Courses

1. ELEMENTARY SPANISH—

ASSISTANT PROFESSOR MACKIMMIE

2. MODERN SPANISH AUTHORS—

ASSISTANT PROFESSOR MACKIMMIE

LANGUAGES AND LITERATURE: MUSIC

ASSISTANT PROFESSOR ASHLEY.

Elective Courses

1. HISTORY AND INTERPRETATION OF MUSIC—

ASSISTANT PROFESSOR ASHLEY

2. HISTORY AND INTERPRETATION OF MUSIC—

ASSISTANT PROFESSOR ASHLEY

Division of Rural Social Science

PRESIDENT BUTTERFIELD.

AGRICULTURAL ECONOMICS

ASSISTANT PROFESSOR CANCE, ASSOCIATE PROFESSOR EYERLY.

Required Course

2. AGRICULTURAL INDUSTRY AND RESOURCES—

ASSISTANT PROFESSOR CANCE

Elective Courses

4. ELEMENTS OF AGRICULTURAL ECONOMICS—
ASSISTANT PROFESSOR CANCE
5. HISTORICAL AND COMPARATIVE AGRICULTURE
ASSISTANT PROFESSOR CANCE
6. CO-OPERATION IN AGRICULTURE—Announcement
of modification to be made later.
ASSISTANT PROFESSOR CANCE (Part I.)
ASSOCIATE PROFESSOR EYERLY (Part II.)
7. SPECIFIC PROBLEMS IN AGRICULTURAL ECONOMICS—
ASSISTANT PROFESSOR CANCE
- 9, 10. SEMINAR—
ASSISTANT PROFESSOR CANCE

AGRICULTURAL EDUCATION

PROFESSOR HART, ASSISTANT PROFESSOR JENKS.

Elective Courses

1. MEANING OF EDUCATION (PSYCHOLOGY)—
PROFESSOR HART
2. VOCATIONAL EDUCATION (HISTORY AND PHILOSOPHY)—
PROFESSOR HART
3. METHODS (RURAL SCHOOL PROBLEMS)—
PROFESSOR HART
4. TEACHERS' AGRICULTURE—
PROFESSOR HART AND ASSISTANT PROFESSOR JENKS
- 5, 6. SEMINAR IN EDUCATION—
PROFESSOR HART

RURAL SOCIOLOGY

ASSOCIATE PROFESSOR EYERLY, PRESIDENT BUTTERFIELD, PROFESSOR
HART, MR. HOLCOMB.

Elective Courses

2. THE RURAL COMMUNITY—A broad survey of the field of rural sociology, including such topics as the movements of the rural population, the social conditions and life of rural people, the influence of rural life, the description of the various social institutions of the rural community, an analysis of the fundamental problems of rural life, and the means of developing and redirecting the life of the rural community. Lectures, readings and essays on assigned topics. 3 hours. Credit 3.
PRESIDENT BUTTERFIELD AND ASSOCIATE PROFESSOR EYERLY.
3. THE LITERATURE OF RURAL LIFE—A critical and appreciative study of writers, both in prose and poetry, who have interpreted Nature from the viewpoint of the lover of country life, and those who have idealized agriculture, horti-

culture, and other rural pursuits, together with those who have upheld as an ideal the development of a rural environment in cities; 3 hours. Credit 3. MR. HOLCOMB.

4. RURAL LAW—The work of this course will cover such points as land titles, public roads, rights incident to ownership of live stock, contracts, commercial paper, and distinctions between personal and real property. Text, written exercises, lectures, and class discussions. 1 hour. Credit 1. PROFESSOR HART.
5. THE SOCIAL CONDITIONS OF THE RURAL PEOPLE—Composition of the rural population; vital statistics; nature, extent and causes of diseases and accidents; health agencies of control; extent and causes of delinquency and dependency; conditions of temperance, of sexual morality and family integrity; child labor; woman's work and position; relation of employer to employee; standard of living; size of family; cultural ideals; community consciousness and activity; standards of business conduct and of political ethics. 3 hours. Credit, 3. ASSOCIATE PROFESSOR EYERLY.
6. SOCIOLOGICAL ASPECTS OF CO-OPERATION AMONG FARMERS—Social causes of early unsuccessful attempts at co-operation among farmers in the United States; social conditions and personal qualities necessary to successful co-operation as these are exemplified especially in European countries; the various forms of co-operative organization viewed in their intellectual and moral aspects; the influence of co-operation on individualism, conservatism, self-help and social strain, on scientific agriculture, on farm labor, on legislation; the relation of co-operation to neighborhood life, to community pride and loyalty, to further associated effort, to class stability, solidarity and status; the demand of co-operation for a new type of leadership. 3 hours. Credit, 3. (Given in 1911-12; not given in 1912-13). ASSOCIATE PROFESSOR EYERLY.
7. RURAL INSTITUTIONS—A study of the organized agencies by which rural communities carry on their various forms of associated life; particularly a study of the ways by which the domestic, economic, cultural, religious and political institutions contribute to rural betterment. Special attention given to the rural family and the rural church. 3 hours. Credit, 3. ASSOCIATE PROFESSOR EYERLY.
8. THE STATE AND THE FARMER—Not given in 1911-12. ASSOCIATE PROFESSOR EYERLY.
9. THE SOCIAL PSYCHOLOGY OF RURAL LIFE—Characteristics of the rural mind; character of hereditary

and environmental influences; nature and effects of face to-face groups; psychological effects of isolation, relative security and freedom from strain; relation of contact with nature, of control over immediate environment, of family co-operation and of neighborhood life to self-control, self expression, sympathy, service and leadership; nature and effects of fashion, conventionality and custom; character of discussion and public opinion and their relation to class feeling and organization; relation of individualism, conservatism, and homogeneity to crowd phenomena and progressive democracy. 3 hours. Credit, 3.

ASSOCIATE PROFESSOR EYERLY.

10. FARMERS' ORGANIZATIONS—The history, purposes, and achievements of the Grange, the Farmers' Union, farmers' clubs, village improvement associations, boys' clubs, etc.; the nature, scope, methods and history of local, state and national associations formed about some farm product or special farm interest, e. g., dairying, horticulture, stock breeding, forestry; their influence on "better farming, better business, better living;" their influence in forming a class consciousness and in shaping legislation; need of federation. 3 hours. Credit, 3. ASSOCIATE PROFESSOR EYERLY.
11. SOCIOLOGICAL ASPECTS OF CURRENT AGRICULTURAL QUESTIONS—Government conservation policy, roads, railways, trolleys, telephones, postal service, credit facilities, taxation, pure food laws, tenancy and ownership, intensive versus extensive farming, agricultural labor. 3 hours. Credit, 3. ASSOCIATE PROFESSOR EYERLY.
13. SEMINAR—Subject for 1911-12: Correctional Agriculture. ASSOCIATE PROFESSOR EYERLY.

General Departments

MILITARY SCIENCE AND TACTICS

CAPTAIN MARTIN, MR. PARSONS.

Required Courses

1. INTRODUCTION TO MILITARY SCIENCE AND TACTICS— CAPTAIN MARTIN
2. INTRODUCTION TO MILITARY SCIENCE AND TACTICS— CAPTAIN MARTIN
3. PRACTICE OF MILITARY SCIENCE AND TACTICS CAPTAIN MARTIN

4. PRACTICE OF MILITARY SCIENCE AND TACTICS
CAPTAIN MARTIN
5. THEORY OF MILITARY SCIENCE AND TACTICS—
CAPTAIN MARTIN
6. THEORY OF MILITARY SCIENCE AND TACTICS—
CAPTAIN MARTIN
7. PRACTICE OF HIGHER MILITARY SCIENCE AND
TACTICS—
CAPTAIN MARTIN
8. PRACTICE OF HIGHER MILITARY SCIENCE AND
TACTICS—
CAPTAIN MARTIN
9. THEORY OF HIGHER MILITARY SCIENCE AND
TACTICS—
CAPTAIN MARTIN
10. THEORY OF HIGHER MILITARY SCIENCE AND
TACTICS—
CAPTAIN MARTIN

Elective Courses

11. ADVANCED MILITARY SCIENCE AND TACTICS—
CAPTAIN MARTIN
12. ADVANCED MILITARY SCIENCE AND TACTICS—
CAPTAIN MARTIN

PHYSICAL EDUCATION AND HYGIENE

ASSISTANT PROFESSOR HICKS.

HYGIENE

Required Courses

1. HYGIENE—
ASSISTANT PROFESSOR HICKS

PHYSICAL EDUCATION

Required Courses

1. ELEMENTARY GYMNASTICS—
ASSISTANT PROFESSOR HICKS
2. ELEMENTARY GYMNASTICS—
ASSISTANT PROFESSOR HICKS
3. GRADED GYMNASTICS— ASSISTANT PROFESSOR HICKS
4. GRADED GYMNASTICS— ASSISTANT PROFESSOR HICKS
5. HEAVY GYMNASTICS— ASSISTANT PROFESSOR HICKS
6. HEAVY GYMNASTICS— ASSISTANT PROFESSOR HICKS

Elective Courses

7. TRAINING COURSE— ASSISTANT PROFESSOR HICKS
8. TRAINING COURSE— ASSISTANT PROFESSOR HICKS
- 9, 10. ADVANCED GYMNASTICS—
ASSISTANT PROFESSOR HICKS

SOPHOMORE and FRESHMAN CLASSES for SEPTEMBER, 1911

Massachusetts Agricultural College Bulletin

Vol. III, No. 6

AMHERST, MASSACHUSETTS.

October, 1911

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SHORT COURSES



Published six times a year by the Massachusetts Agricultural College, January, February, March, May, September, October.

Entered as second-class matter at the postoffice at Amherst, Mass.

SHORT COURSES FOR 1912

OF

Massachusetts Agricultural College



TEN WEEKS' GENERAL COURSE: Agriculture, Horticulture, Animal Husbandry, Dairying, Floriculture, Market Gardening, Veterinary Science, Forestry, Landscape Gardening, Poultry Management, etc.
January 2nd to March 8th.

POULTRY CONVENTION—
March 4th—8th.

FARMERS' WEEK—
March 11th to 15th, inclusive.

BEE KEEPING COURSE—
May 29th to June 12th, inclusive.

SUMMER SCHOOL—
Will be omitted in 1912. Resumed in 1913.

CONFERENCE RURAL LEADERS—
June 28th—July 3rd.

FACULTY

- KENYON L. BUTTERFIELD—President and Professor of Rural Sociology.
- WILLIAM D. HURD—Director of Extension Work.
- ALEXANDER E. CANCE—Assistant Professor of Agricultural Economics.
- E. K. EYERLY—Assistant Professor of Political Science and Lecturer on Rural Sociology.
- HENRY T. FERNALD—Professor of Entomology.
- JAMES A. FOORD—Professor of Farm Administration.
- JOHN C. GRAHAM—Associate Professor of Poultry Husbandry.
- CHARLES R. GREEN—Librarian.
- WILLIAM R. HART—Professor of Agricultural Education.
- ARTHUR K. HARRISON—Instructor in Landscape Gardening.
- SIDNEY B. HASKELL—Assistant Professor of Agronomy.
- GEORGE N. HOLCOMB—Lecturer in History.
- WILLIAM P. B. LOCKWOOD—Associate Professor of Dairying.
- F. A. McLAUGHLIN—Assistant in Botany.
- JOHN A. McLEAN—Associate Professor of Animal Husbandry.
- FRANK F. MOON—Associate Professor of Forestry.
- ALVAH J. NORMAN—Extension Instructor in Pomology.
- A. V. OSMUN—Associate Professor of Botany.
- JAMES B. PAIGE—Professor of Veterinary Science.
- ELVIN L. QUAIFFE—Instructor in Animal Husbandry.
- FRED C. SEARS—Professor of Pomology.
- ROBERT J. SPRAGUE—Professor of Economics.
- GEORGE F. STORY—Extension Instructor in Dairying.
- E. D. WAID—Assistant Director of Extension Work.
- NEWTON WALLACE—Electrician.
- FRANK A. WAUGH—Professor of Landscape Gardening.
- EDWARD A. WHITE—Professor of Floriculture.
- F. L. YEAW—Assistant Professor of Market Gardening.

ANNOUNCEMENT

The short courses at the Massachusetts Agricultural College are offered to meet the needs of those, both young and old, who want to study principles and modern methods in agriculture, and who for various reasons are unable to attend the four year courses. The work is planned to bring before the student the results of the latest investigations in agricultural science, and to point out their practical application.

Instruction will be given by the regular faculty of the college by means of lectures, recitations, laboratory and practical work; from time to time they will be assisted by non-resident lecturers on special subjects. The work in the classroom will be supplemented by demonstration work in the laboratory, dairy room, greenhouse and stables. The library of over 30,000 carefully selected volumes offers exceptional opportunities for special study in agriculture, horticulture, and related sciences.

Students will be required to elect courses to make not more than twenty nor less than twelve exercises each week. The arrangement of courses is such that students must follow certain lines of work. Those electing Dairy Industry, Floriculture, or Horticulture, must also take courses in allied subjects, as noted in the description of these courses. In general agriculture more latitude is allowed, but it is expected that students will show a definite purpose in the selection of work. All elections, as well as any deviation from the regular rule, must be approved by the Director.

COURSES OF INSTRUCTION

A. Agricultural Group.

1. Soil Fertility.

Professor Hurd and Professor Waide

The nature of soils, their chemical and physical properties. The improvement of "run-down" land. Tillage. Green manuring. Crop rotation. Drainage. Stable manures, their value, composition, preserving and application. Commercial fertilizers, their nature. Materials which furnish the different elements. Fertilizers for different crops, the duplication of formulae. Lime and liming. Three exercises a week for ten weeks. Required of all students.

2. Field Crops.

Professor Haskell

The production of field crops for New England; species and varieties, agricultural characteristics, methods of culture, rotations, harvesting and curing. The laboratory work will give the student practice in seed selection and testing for quality



HAYING

purity and germination, and in corn and potato judging. Laboratory course is limited to 18 students. Three exercises each week for ten weeks. See Course 1.

3. Breeds and Breeding.

Professor McLean and Mr. Quaipe

This course gives attention chiefly to dairy cattle, and covers, as well as the time will allow, characteristics of the breeds, comparative judging and scoring of dairy breeds, together with some of the more practical problems and principles of breeding. The college herd furnishes good material for judging practice. Three exercises weekly, with appointed hours for stock judging.

4. Feeding and Management.

Professor McLean and Mr. Quaife

A short time will be given to the composition of feed stuffs and the principles of nutrition, including a study of the feed stuffs and their effect on production. Specific problems of management, chiefly of dairy stock, will be considered, and practice given in compounding rations according to the most accepted standards. Two exercises weekly.

5. Dairying. *Professor Lockwood, Mr. Story and assistants*

Milk and milk production, creaming methods. Babcock and acid tests. Methods for testing individual cows. Milk handling for local markets. Ripening cream and butter-making



DAIRY BARN

Dairy buildings, lighting, ventilation and sanitation. Three one hour and (2 two hour) periods. Courses limited to 32 (2 three hour) students, owing to lack of laboratory accommodations.

6. Dairy Bacteriology.

Professor Lockwood

The characteristics and functions of bacteria and their relation to the different branches of the dairy industry. The scientific basis for cream ripening, sterilization, pasteurization, control of fermentation and the production of the best quality of market milk. Two exercises each week.

7. Animal Diseases and Stable Sanitation. *Doctor Paige*

Lectures upon some of the common diseases of live stock, giving special attention to methods of prevention, care and sanitation. The treatment of emergencies and accidents. How to keep animals healthy. Two exercises each week.

8. Poultry Course.

Professor Graham

The course will consist of lectures on poultry house construction, winter egg production, incubation and brooding, feeds and feeding and marketing poultry and eggs. Besides the lectures, there will be one or two demonstration periods per week, depending upon the size of the class. Demonstrations or practical work will be given on killing, picking, and



JUDGING AND SCORING BIRDS

caponizing, sorting and packing eggs for market, judging fowls for egg production, studying types, and studying construction of incubators and brooders. Our present equipment will enable us to demonstrate various methods in housing and feeding.

As much practical work as it is possible to give will be furnished those who want it, although this will necessarily be limited.

B. Horticultural Group.

9. Fruit Growing.

Professor Sears

The work in this course will deal with the practical side of the growing and marketing of fruits. Especial attention will be given to such questions as selection of site for the plan-

tation, choice of varieties, grafting and budding, spraying, pruning, cultivation and cover crops, fertilizing the fruit plantation, packing and marketing. Text books and lectures, supplemented with demonstrations; and, whenever possible, actual work by the students. Five exercises each week for ten weeks.

Students electing Horticulture will also be required to take Course 1, and it is recommended that they take Courses 13 and 14.

10. Market Gardening.

Professor Yeaw

A general survey of the market gardening business, together with a study of the most important problems involved, such as location, soils, fertilizers, crops, systems of cropping, markets and marketing. Three lectures and one afternoon practicum each week for ten weeks.



FRENCH HALL

11. Landscape Gardening. *Professor Waugh and Mr. Harrison*

The general principles underlying the art, with special reference to modern American methods. The various styles of gardening, the simpler problems, and some notice of the most important American masterpieces. Twenty exercises. Class limited to 15.

12. Floriculture.

Professor White

This course is outlined with the idea of furnishing young men who have not the time to devote to a longer course, with

the theoretical and practical considerations which are essentials for success in Floriculture. The course will cover, as thoroughly as time will permit, those aspects of the work of special interest to the grower. Some of the topics to be considered are greenhouse construction, greenhouse details, such as ventilators, gutters, benches, etc., greenhouse furnishings and equipment, heating, florists' crops and florists' trade.

The lecture work will all be given in the mornings; the afternoons will be devoted to practical work in the greenhouses. All taking the course should bring a working suit. Saturdays there will be special trips to some of the most up-to-date floricultural establishments in the state. Many of these will be in the vicinity of the college, but one trip of two or three days' duration will be made through the eastern part of the state, especially in the vicinity of Boston. These visits to the practical men have been most helpful in previous years. "Write-ups" of each trip are part of the course.

In addition to the regular lecture work of the course, it is expected that lectures will be given by experts in growing special crops, such as roses, carnations, violets and orchids. The co-operation of several of the most up-to-date florists has been secured for these lectures. Five exercises each week.

Students electing this course will also be obliged to take Courses 1, 13 and 14.

13. Forestry.

Professor Moon

Lectures given to acquaint short course students with the importance of conserving the forests and forest products. The value of the forests to the state and nation. Special attention given to the handling of the farm wood lot. One lecture a week for ten weeks.

C. Related Sciences.

14. Botany.

Professor Osman and Mr. McLaughlin

A study of the structure, function and diseases of greenhouse, garden, orchard and field crops, together with methods of prevention, including spraying and the application of fungicides. One period each week will be devoted to laboratory work. Three exercises each week.

15. Entomology.

Professor Fernald and assistants

A study of the insects causing most injury to farm, orchard, garden and greenhouse crops, and methods for their destruction or control. Animal parasites and their prevention. Three exercises each week.

D. General Subjects.

16. The Development of the Community.

A course offered to short course winter students to acquaint them with some of the problems of rural community building and rural betterment. The course will consist of a series of lectures on the following subjects:

The Development of the Rural Community.
 Farm Labor, Immigration and Farmers' Organizations.
 The Government in Rural Communities.
 The Educational Problems of Rural Communities.
 Agricultural Literature.

The lectures will be given by President Butterfield, Dr. Sprague, Professor Hart, Dr. Cance, Professor Eyerly, and Professor Holcomb. Two periods a week for ten weeks.



DAIRY BARN

17. Farm Buildings and Machinery. *Professor Foord*

The location and planning of farm buildings and the water supply, the construction and operation of farm machinery. One exercise a week for ten weeks.

18. Farm Accounts. *Professor Foord*

Practical work in keeping farm accounts and records. A simple system by which profits and losses of the farm may be traced to their original sources. One exercise each week.

19. Mechanics. *Professor Lockwood and Mr. Wallace*

Care of boilers, engines and dairy machinery, installing and lining shafts and pulleys; calculating speeds of pulleys, etc. Cement foundations and floors. Plans for farm and dairy buildings. One exercise of two hours each week.

20. Meat, Meat Production, and Marketing on the Farm
Mr. Hinkley, of Armour & Co.

A course in which there will be demonstrations of dressing beef, cutting up the quarters, with explanation of the value of the different cuts, dressing hogs, sausage making, the curing, pickling and preserving meats for home and market, finding a market for, and marketing meats grown on the farm. Three afternoons during the course.

EXPENSES AND OTHER INFORMATION

A registration fee of \$5.00, payable in advance is charged those who take the ten weeks course. No registration fees are charged in the other short courses mentioned in this bulletin.

Other expenses of taking the short courses are about as follows:

Furnished rooms in private families, per week,	\$1.00-3.00
Board at College Dining Hall, per week	4.00
Board in private families, per week	4.00-5.00

Students in each of the dairy courses must provide themselves with two white wash suits and a white cap for use in the practical dairy work. The cost in Amherst is about \$1.25 for suit and cap.

BOARD AND ROOM

Short course students can obtain board at Draper Hall on the campus, at \$4.00 per week. A list of available rooms is furnished at registration time, and every effort will be made to see that all who come will be comfortably located.

REQUIREMENTS FOR ADMISSION

No entrance examinations are required, but students are advised to review their school work in English and arithmetic before entering. Practical experience in farm, garden, orchard or greenhouse work will be an advantage. The courses are open to both men and women.

Students must be at least 18 years of age, and must furnish satisfactory evidence of good moral character.

Application for admission should be made as early as possible, on the card enclosed with this circular. Limited

accommodations in the Dairy Laboratory make it necessary to limit this work to thirty-two. Students will be accepted in this course in the order in which their applications are received.

Students should report to the Director on Monday, January 1st, in order to begin work promptly on the morning of January 2nd.

THE LIBRARY

The college library occupies the entire lower floor of the Chapel—library building—and contains nearly 30,000 volumes in addition to a large number of pamphlets. The equipment is such that the library ranks extremely well with the agricultural libraries of the country. Short course, as well as regular students, are able to find splendid material in every line of



WINTER SPRAYING DEMONSTRATION

college work, especially in agriculture, botany, entomology and sociology. The reading room is provided with a variety of magazines, encyclopedias and reference books, in addition to the newspapers and agricultural weeklies.

The library hours are from seven forty-five a. m. to nine p. m. every week day, excepting meal time, and from nine a. m. to two p. m. on Sundays. The librarian or his student assistants will always be on hand, ready and willing to be of assistance to short course students.

THE STOCKBRIDGE CLUB

Is a student organization which holds meetings every week for the discussion of agricultural and horticultural affairs. Its meetings are often addressed by well-known specialists. Membership is open to students of the short courses.

Y. M. C. A.

Meetings conducted by students and outside speakers, are held regularly on Thursday evenings, at 6.45 o'clock, in the Stone Chapel. All short course students are cordially invited to attend these meetings.

ASSEMBLY

In past years both regular and short course students in the college have been required to attend chapel daily and assembly once a week.

On account of lack of seats in the chapel, due to the increase of regular students, short course students in 1912 will not be required to attend chapel or assembly, but are required to attend the lectures on the Development of the Community, which have been placed at the same hour of the assembly.

OTHER SHORT COURSES, ETC.

POULTRY CONVENTION

March 4th—8th inclusive.

In order to give a large number of poultry men who cannot come to the college for a longer time, practical instruction in modern methods of breeding, feeding, poultry house construction, operation of incubators and brooders, selecting and judging poultry for utility and for show, marketing poultry products, etc., a convention lasting nearly a week will be held on the dates given above. The week will be filled with practical talks and demonstrations. Some of the leading professional and practical men in this country will be engaged to supplement the work of the regular faculty.

No charges aside from cost of room and board are made those who come for this course.

FARMERS' WEEK

March 11th—15th, 1912

In order to reach those who cannot come to the college for a longer time, this very practical course, four days in length, will be given. The regular college equipment will be used, and the work of the regular faculty will be supplemented by lectures and demonstrations given by eminent men.

The work will be divided into three sections: (1) General Agriculture, to include Farm Management, Farm Crops, Dairy-

ing, Animal Breeding and Feeding, Veterinary Science and Bacteriology; (2) Horticulture, to include Fruit Growing, Market Gardening, Floriculture and Forestry; (3) Farmers' Wives' Section, including lectures and demonstrations in Home Economics, Cookery and problems of Home-Making.

Features of the week will be the evening lectures by specialists along agricultural lines, the conference pertaining to problems of rural betterment aside from practical agricultural topics, a corn and grain show, and others.

The Massachusetts Dairymen's Association, M. A. C. Agricultural Improvement Association and other organizations will hold their annual meetings at the college this week.

Complete program will be published and sent on request later.

COURSE IN BEE KEEPING

May 29th—June 12th, 1912

The college has recently come into possession of a number of swarms of bees which, with the other equipment to be added, will afford a fine opportunity for those interested to get some practical information on this subject.

The course will be under the direction of Dr. Burton N. Gates. The following courses will be given:

1. Practical Phases of Bee Keeping,
Dr. Burton N. Gates
2. Crops for Honey Bees, Dr. William P. Brooks
3. Relation of Bees to the Pollination of Plants,
Dr. George E. Stone
4. Origin and Evolution of the Honey Bee,
Dr. Henry T. Fernald
5. Bees, and Bee Keepers' Supplies,
Dr. James B. Paige

THE SUMMER SCHOOL

The very successful Summer School of agriculture and country life which has been held by the college for the last five years will be omitted in 1912. In 1913 it will be resumed, with the addition of new courses, more instructors, and covering a broader scope of work.

A bulletin giving the courses, instructors and other information will be issued in March, 1913.

CONFERENCE OF RURAL LEADERS

June 28—July 3.

The Conference of Rural Leaders which has been held as a closing feature of the summer school will take place as usual except at an earlier date (June 28th—July 3 inclusive).

The Federation of Churches of Massachusetts, the State Library Commission, Massachusetts Civic League, the New

England Home Economics Association, the County Work of the Y. M. C. A., and the State Board of Education have each decided to co-operate with the college by furnishing teachers and lecturers for their respective sections. The State Grange and the State Board of Health have been asked to co-operate in a similar manner.

Definite class instruction will be given each morning. The afternoons will be given up entirely to special and general conferences, demonstrations of organized play, recreation, etc. The evenings will be given over to music and lectures by the most eminent men, who are making a study of rural sociology, economics and education.

The Rural Social Service exhibits will be more elaborate and extensive than in 1911.

The object of this conference is to acquaint those who are leaders in their respective communities with the work that is going on, not only in Massachusetts, but in New England and other parts of the world, and to give them renewed inspiration and enthusiasm for larger and more intelligent efforts.

Teachers, clergymen, grange officers, librarians, county Y. M. C. A. workers, town officers, boards of health, officers of village improvement societies, home makers, school officers, and all others interested in community development are cordially invited to attend this conference. The expenses for board and room are low. There are no tuition or registration fees.

A complete program will be published next May, and can be had by making application for it.

HELPS FOR THOSE WHO CANNOT COME TO ANY OF THE SHORT COURSES

Lecture Courses and Practical Demonstration

The public lecture work of the faculty has been systematized. Granges, Farmers' Clubs, Young Men's Christian Associations, Boards of Trade, Women's Clubs, Village Improvement Societies and other organizations can secure lectures covering agriculture and allied subjects, either singly, or courses of several lectures can be arranged for. Practical demonstrations, such as spraying, milk testing, stock judging, mixing fertilizers, fruit grading and packing, and others of a similar nature, will also be given when application is made for them. Organizations named above can arrange with the college to have a series of evening meetings, at which agricultural subjects and topics pertaining to rural life will be presented in a

popular way. It should be understood that the number of men available for this work is at present limited; hence early application is desirable.

Send for circular giving lecturers' names and subjects.

Correspondence Courses

So many calls have come to the college for lessons by correspondence that courses in Soils and Soil Improvement, Manures and Fertilizers, Field Crops, Farm Dairying, Fruit Growing, Market Gardening, Animal Feeding, Floriculture, Farm Accounts, Agriculture for Secondary Schools, and Agricultural Education have been prepared.

A small fee, to cover cost of postage, etc., is charged in each course.

Send for circular fully describing these.

Other Extension Work

Through the Extension Work the Massachusetts Agricultural College endeavors to help all the people in the Commonwealth who are interested in securing agricultural information. A corps of field agents is being engaged to carry up-to-date information to all who ask for it.

The college is also helping the people of the state by equipping **agricultural trains**, by holding **extension schools** lasting three or four days in various sections of the state, by making **educational exhibits** at fairs, by starting **demonstration orchards** in every county, by helping in the organization of **crop and animal improvement societies**, by conducting **field experiments** to demonstrate the value of certain agricultural practices, by conducting **agricultural surveys**, by **giving advice** as to farm management, and by **answering thousands of inquiries** which come to us every year.

For further information regarding any of the short courses mentioned in this bulletin, or other lines of extension work, apply to

WILLIAM D. HURD,

Director of Extension Work,

Amherst, Mass.

The Massachusetts Agricultural College offers full undergraduate courses in the different lines of Agriculture, Horticulture, Chemistry, Botany, Entomology, Veterinary Science, Bacteriology, Forestry and other sciences. For catalogue and other information, address the President.

KENYON L. BUTTERFIELD,

Amherst, Mass.

Massachusetts Agricultural College

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